THE

Gentleman's Diary,

OR THE

MATHEMATICAL REPOSITORY;

An ALMANACK

For the YEAR of our LORD 1749.

Being the First after BISSEXTILE, or LEAP-YEAR.

Containing many useful and entertaining Particulars, peculiarly adapted to the ingenious Gentlemen engaged in the Study and Practice of the

MATHEMATICKS.

The Ninth *Almanack* ever publish'd of this Kind

——— Quâ causâ argentea Phœbe
Pallibus haud æquis graditur; cur subdita nulli
Hactenus Astronomo numerorum frena recusat;
Cur Tendant Nodi, curque Anfes progrediuntur.
——— Quantis refluum vaga Cynthia pontum
Viribus impellit; dum fractis fluctibus ulvam
Deserit, ac Nautis suspectas nudat arenas,
Alternis vicibus suprema ad littora pulsans.

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M DCC XLIX.

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N. B. *Several Letters came to hand too late to be inserted this Year, therefore we hope they'll be sent in time for the future.*

ANUARY hath xxxi Days.

	M D	Day Breaks.	Sun's Decl.
ew Moon 7 Day at 7 at Night	6	5 50	20 S 41
irſt Quarter 14 at 11 Morning	12	5 43	19 21
ull Moon 22 Day at Noon	18	5 35	17 50
aſt Quarter 30 Day at 1 Afternoon	24	5 26	16 6
	31	5 14	13 54

1	A	Circumciſion. New Years Day.	loins	0 M 51	5 M 54
2	M	*The Weather this Year is likely to*	ſecr.	2 24	6 42
3	T	*begin pretty much as the Old ended*	blad.	3 53	7 30
4	W	*(except ſome ſudden Alteration.)*	hips	5 7	8 30
5	T		thig.	6 14	9 30
6	F	Epiph. Notting. Epiph. Fair	kne.	7 9	10 33
7	S	is always the 1ſt Fr. aft. Jan. 2.	ham.	☽ Sets	11 40
8	A	1 Sunday after Epiphany	legs	5 A 26	0 42
9	M	*Pretty much Rain,*	ank.	6 52	1 38
10	T	*Snow or Sleet;*	feet	8 20	2 30
11	W	*but perhaps not very cold*	toes	9 57	3 17
12	T	*for the Seaſon.*	head	11 20	4 7
13	F	Hilary. Lhar. comes in	face	Morn.	4 55
14	S	Oxf. Hil. and Cam. L. T. beg.	neck	0 44	5 46
15	A	2 Sunday after Epiphany	thro.	2 2	6 37
16	M	*Now expect more*	arms	3 17	7 26
17	T	*Cold, and perhaps*	and	4 27	8 19
18	W	*Froſty and ſomewhat*	ſhou.	5 27	9 10
19	T	*more fair.*	brea.	6 5	10 2
20	F	Octab. Hil. 1. Ret. Pr. of W. b.	and	6 40	10 50
21	S	St. Agnes.	ſtom	7 4	11 40
22	A	Septuageſima Sunday	heart	Riſes	Morn.
23	M	Hillary Term begins	back	5 A 54	0 18
24	T	*No great Alteration*	bow	7 7	1 0
25	W	St. Paul's Converſion	belly	8 15	1 41
26	T	*but winterly*	reins	9 26	2 19
27	F	Quind. Hill. 2 Ret.	and	10 40	3 0
28	S	*Weather new*	loins	11 57	3 44
29	A	Sexageſima Sunday	ſecre	Morn	4 29
30	M	K. C. I. m. at W. H. 12 paſt 1.	blad.	1 15	5 16
31	T	*and to the End.* [1648-9	hips	2 30	6 1

	Sun Riſes.	Sun Sets.	Watch. too faſt	Saturn Riſes.	Jupiter Sets.	Mars Riſes.	Venus Riſes.	Mercu. Riſes
1	8 1	3 59	10 51	2 M 37	6 N 39	2 M 32	5 M 34	7 M 40
2	7 52	4 8	12 34	2 12	6 22	2 25	5 46	7 47
3	7 42	4 18	13 49	1 49	6 6	2 20	5 54	7 45
4	7 31	4 29	14 33	1 27	5 51	2 15	6 0	Sets.
5	7 17	4 43	14 48	1 1	5 32	2 7	6 5	5 N 18

FEBRUARY hath XXVIII Days.

M D	Day Breaks	Sun Declin
New Moon 6 Day at 6 Morn.	6 5 4	11
First Quarter 13 Day at 2 in the Morn.	12 4 54	9
Full Moon 21 Day at 7 Morn.	18 4 40	7
Last Quarter 28 at 12 at Night.	24 4 29	5
	28 4 19	3

M D	W D	Sundays, Holy Days, remarkable Days, Length, Inc. and Dec. of Days, Terms, Weather, &c.	Moon Signs	Moons Rising & Sett.	Moon South ing.
1	W	*At the beginning of*	thig.	3 M 44	7 M
2	T	Purification, or Candlemas Day	knee	4 46	8
3	F	Craft. Purif. 3 Ret.	ham.	5 31	9
4	S	*this Month expect*	legs	6 5	10
5	A	Quinquagesima or Shrove Sund	ankl	6 26	11
6	M	*blustering Winds*	feet	☽ Sets	0 A
7	T	Shrove Tuesday	toes	7 14	1
8	W	Ash Wednes. first Day of Lent.	head	8 46	1
9	T	Octab. Purif. 4 Return	face	10 17	2
10	F	*with Rain,*	neck	11 42	3
11	S	*Snow or Sleet.*	and	Morn.	4
12	A	Quadragesima. 1 Sun. in Lent.	thro.	1 3	5
13	M	Term ends	arms	2 15	6
14	T	**Valentine.**	sho.	3 22	7
15	W	Ember Week	brea.	4 5	8
16	T	*Now very like*	sto.	4 42	8
17	F	*to be more*	ribs	5 10	9
18	S	*fair and pleasant*	heart	5 28	10
19	A	2 Sunday in Lent. Reminiscere	back	5 45	11
20	M	*More wet may*	bow	5 57	11
21	T	*now be expected*	and	☽ Rises	Morn.
22	W	Princess of HESSE born	belly	7 19	0
23	T	*Dark and*	reins	8 34	1
24	F	St. MATTHIAS.	loins	9 50	1
25	S	*Cloudy now*	secr.	11 9	2
26	A	3 Sunday in Lent. Oculi	blad.	Morn.	3
27	M	*and to the End*	hips	0 24	4
28	T	*of the Month.*	thig.	1 40	5

M D	Sun Rises	Sun Sets	Watch too fast	Saturn Rises.	Jupiter Rises.	Mars Rises.	Venus Rises.	Mercu Sets
6	7 5	4 55	14 31	12N 35	7 M 22	2 M 5	6 M 2	6 N
12	6 53	5 8	13 49	12 11	7 0	1 59	5 59	6
18	6 41	5 19	12 44	11 49	6 50	1 56	5 56	7
24	6 28	5 32	11 21	11 27	6 21	1 51	5 51	7
28	6 20	5 40	10 19	11 12	6 2	1 47	5 46	6

MARCH hath xxxi Days.

	M D	Day Breaks.	Sun's Declin.
New Moon 7 Day at 3 in the Afternoon	6	4 7	11 12
First Quarter 14 Day at 8 at Night.	12	3 52	1 N 11
Full Moon 22 Day at 12 at Night	18	3 38	3 30
Last Quarter 30 at 8 in the Morn.	24	3 23	5 50
	31	2 28	8 26

1	W	St. DAVID, *A Bishop of Mineu.*	kne.	2	44	6 6
2	T	Chad 25.	and	3	38	7 6
3	F	March *Winds*	hams	4	10	8 6
4	S	*with Foggy lowring Weather,*	legs	4	34	9 4
5	A	4 Sund. in Lent. Mid Lent Sun.	ankl.	4	56	10 0
6	M	*and perhaps some Showers.*	feet	5	12	10 51
7	T	Equal Day and Night,	toes	☽	Sets	11 50
8	W	Cyprian ☉ in ♈ 9 Day 16 m	head	7	47	0 A 34
9	T	Cam. latter Act.	face	9	13	1 30
10	F	past 11 in the Morning.	neck	10	44	2 22
11	S	in all the habitable World.	thro.	Morn.		3 15
12	A	5 Sunday in Lent. Judica	arms	0	23	4 11
13	M	Day 12 ho. 18 min. long	sho.	1	14	5 6
14	T	Prince EDWARD born	brea.	2	16	6 1
15	W	*Windy and stormy*	and	2	46	6 51
16	T	☉ due E. 6h. 8 m. Alt. 3°. 20'.	stom	3	18	7 41
17	F	St. *Patrick.*	heart	3	42	8 25
18	S	♑. and Cam. Term ends.	back	3	56	9 7
19	A	6 Sunday in Lent. Palm Sund.	bow	4	11	9 49
20	M	Cuthbert.	and	4	23	10 28
21	T	*Pretty much downfall*	belly	4	37	11 9
22	W	Days 12 ho. 54 min. long	reins	☽	Rises	11 52
23	T	Maunday Thursday	loins	7	45	Morn.
24	F	Good FRID. Our SAV. Crucif.	secr.	9	4	0 35
25	S	LADY DAY or Ann. of V. Mar.	and	10	26	1 24
26	A	EASTER DAY. Our SAV. Ref.	blad.	11	39	2 15
27	M	Easter Monday	hips	Morn.		3 10
28	T	Easter Tuesday	thig.	0	47	4 9
29	W	Days 13 hours 24 min.	kne.	1	40	5 7
30	T	and Night 10 h. 36 min. long	ham	2	18	6 6
31	F	*Still Showery.*	legs	2	47	7 3

M D	Sun Rises.	Sun Sets.	Watch too fast.	Saturn Rises.	Jupiter Rises.	Mars Rises.	Venus Rises.	Mercu. Rises.
0	7 5	53 8	35	10N 42	5 M47	1 M 42	5 M 38	5 M48
12	5 54	6 6	45	10 15	5 24	1 32	5 25	5 22
18	5 42	6 18	4 53	9 51	5 5	1 24	5 18	5 5
24	5 30	6 30	3 2	9 28	4 45	1 15	5 8	4 53
31	5 15	6 45	1 1	9 0	4 28	1 5	4 56	4 42

APRIL hath xxx Days.

M D	Day Break.	Sun's Decl.
New Moon 6 Day at 1 Morning.	6 2 40	10 N
First Quarter 13 Day at 2 Afternoon	12 2 19	12
Full Moon 21 Day at 1 Afternoon	18 1 57	14
Last Quarter 28 at 2 Afternoon.	24 1 32	16
	30 0 53	17

1	S	All Fools Day	ankl.	3	8	7	5
2	A	1 Sund. after Easter; Low Sund.	feet	3	26	8	5
3	M	Marriage comes in	toes	3	42	9	4
4	T	Days 13 hours 45 min. long	head	3	57	10	3
5	W	Dr. & Cam. Easter Term beg	face	4	12	11	2
6	T	*Windy and (if any Rain)*	neck	Sets		0 A	1
7	F	*some* April *Showers.*	thro.	9	44	1	1
8	S	☉ due E. 6h. 37m. Alt. 14°. 50′	arms	11	1	2	
9	A	2 Sunday after Easter.	and	Morn.		3	
10	M	Quin. Pasch. 1 Ret.	sho.	0	3	3	5
11	T	*Not much Alteration*	brea.	0	50	4	5
12	W	Easter Term begins	stom	1	25	5	4
13	T	*for the present.*	heart	1	52	6	2
14	F	*Still expect Wind and Rain*	and	2	11	7	1
15	S	Prince WILLIAM born	*mind*	2	25	7	5
16	A	3 Sunday after Easter	bow	2	39	8	3
17	M	Tres Pasch. 2 Ret.	belly	2	52	9	1
18	T	Days are now increas'd	reins	3	3	9	5
19	W	and Nights shorten'd 7h. 27m.	and	3	15	10	4
20	T	☉ due E. 6h. 50′. Alt. 19°. 30′.	loins	3	30	11	2
21	F	Ampl. 25°. 46.	secr.	Rises		Morn.	
22	S	*Now expect fine*	blad.	9	19	0	1
23	A	4 Sh. after Easter. St. George	hips	10	32	1	
24	M	Mens. Pasch. 3 Return.	thig.	11	40	2	1
25	T	St. MARK the Evan. West. El.	knee	Morn.		3	
26	W	*Showers, and*	ham	0	22	4	
27	T	*pleasant springing*	legs	0	55	5	
28	F	*Weather to the End.*	ankl.	1	19	6	
29	S	Marriage goes out	feet	1	36	6	5
30	A	5 Sun. after Easter, Rogat. S.	toes	1	51	7	4

M D	Sun Rises.	Sun Sets.	Watch too slow.	Saturn Rises.	Jupiter Rises.	Mars Rises.	Venus Rises.	Mercu. Rises.
6	5 4	6 57	0 32	8 N 47	4 M 5	12 N 53	4 M 49	4 M 35
12	4 52	7 8	1 51	8 21	3 45	12 41	4 38	4 25
18	4 40	7 20	2 53	7 57	3 25	12 29	4 27	4 17
24	4 29	7 32	3 36	7 32	3 4	12 14	4 17	4 8
30	4 19	7 41	4 0	7 7	2 43	11 55	4 7	4 0

MAY hath xxxi Days.	M D	Day Breaks	Sun's Decl.
New Moon 5 Day at Noon	6		19 24
First Quarter 13 at 8 Morn	12	No	20 39
Full Moon 20 Day at 12 at Night	18	real	21 41
Last Quarter 27 at 7 Afternoon	24	Night.	22 30
	31		23 8

1	M	St. PH. and JA. Qu. Pasc. 4 Ret.	*horns*	2	4	8	30
2	T	Day 15 ho. and half long	head	2	20	9	18
3	W	Rogation Days	face	2	38	10	9
4	T	Holy Thursday, CHR. Ascen.	neck	3	0	11	2
5	F	Craft. Ascen. 5 Ret.	thro.	☽ Sets		11	57
6	S	*Expect this Month to*	arms	9	50	0	A53
7	A	Sunday after Ascension. Exaudi	sho.	10	43	1	48
8	M	Term ends.	brea.	11	25	2	43
9	T	☉ due E. 7 h. 6m. Alt. 25° 56′	stom	11	54	3	33
10	W	Days increas'd 8 h. 38 min.	ribs	Morn.		4	21
11	T	Dr. and Cain. Terms end	heart	0	10	5	6
12	F	*begin, and continue*	back	0	36	5	48
13	S	*pretty wet for some time.*	bow	0	48	6	30
14	A	Whit-Sunday. Holy Ghost Des.	and	1	0	7	8
15	M	Whit-Monday	belly	1	10	7	50
16	T	Whit-Tuesday	reins	1	21	8	33
17	W	Ember Week	loins	1	34	9	16
18	T	Days 16 h. 16 min. long	secr.	1	51	10	6
19	F	*Now perhaps more*	blad.	2	17	11	2
20	S	*fair and pleasant*	hips	2	44	11	58
21	A	Trinity S. Marr. comes in	thig.	Rises		Morn.	
22	M	Cras. Tr. 1 ret. Tr. C. Dr. El.	kne.	10	19	0	58
23	T	*but not without*	ham	10	56	1	58
24	W	Prince GEORGE born	legs	11	22	2	57
25	T	*some brisk Gales of Wind.*	and	11	42	3	54
26	F	Trinity Term begins	ankl.	11	56	4	45
27	S	*Windy still, but mostly fair*	feet	Morn.		5	38
28	A	1 Sunday after Trinity	toes	0	12	6	26
29	M	K. Charles II. Rest. 2 Ret.	head	0	25	7	12
30	T	Prs. AMEL. and CAROL. born	face	0	43	8	3
31	W	Days 16 h. 38 min. long.	neck	1	0	8	54

M D	Sun Rises.	Sun Sets.	Watch too slow.	Saturn Sets.	Jupiter Rises.	Mars Rises.	Venus Rises.	Mercu. Rises.
6	4 9	7 52	4 21	4 M 3	2 M 22	11 N 41	3 M 58	7 N 6
12	4 0	8 0	3 44	3 38	1 59	11 21	3 50	8 1
18	3 53	8 8	3 17	3 13	1 37	11 0	3 45	8 54
24	3 47	8 13	2 15	2 48	1 14	10 39	3 41	9 37
31	3 42	8 19	0 58	2 17	0 15	10 10	3 38	10 0

JUNE hath xxx Days.

M D	Day break.	Sun's Decl
New Moon 3 Day at 11 at Night	6	23 2
First Quarter 12 at 1 Morn.	12 All	23 8
Full Moon 19 Day at 9 Morn.	18 Twi-	23 16
Last Quarter 25 at 12 at Night.	24 light.	22 4
	30	22 8

1	T	*Expect fine warm*	thro	1	2	9	47		
2	F	*Summer Weather*	arms	1	54	10	41		
3	S	*about the beginning*	sho.	☽	Sets	11	A	35	
4	A	2 Sunday after Trinity	brea.	9	20	0		29	
5	M	Quind. Trin. 3 return	stom	9	50	1		22	
6	T	Day 8 h. 42 min. long.	ribs	10	15	2		10	
7	W	*Now pretty hot*	heart	10	30	3		1	
8	T	*and probably not*	back	10	45	3		40	
9	F	*without some Showers*	bow	11	0	4		19	
10	S	☉ in ♋ 11 D. 1 h. 50 m. P. M.	and	11	12	5		0	
11	A	S. af. Tr. Barn. K. GEO. II. Ina.	belly	11	22	5		40	
12	M	Tres Trin. 4 return	reins	11	35	6		20	
13	T	*and perhaps some*	join.	11	48	7		2	
14	W	Term ends.	secr.	Morn.		7		50	
15	T	K. GEORGE II. proclaimed	priv.	0	7	8		40	
16	F	*sudden Claps*	blad.	0	34	9		35	
17	S	*of Thunder*	hips	1	13	10		36	
18	A	4 Sunday after Trinity	thig.	2	5	11		38	
19	M	Days decreas'd and Nights	kne.	☽	Rises	Morn.			
20	T	now lengthened 4 min.	ham	9	19	0		39	
21	W	*Still hot*	legs	9	44	1		36	
22	T	☉ due E. 7 h. 19′. Alt. 29°. 56′.	ankl.	10	0	2		32	
23	F	*and Show'ry*	feet	10	15	3		24	
24	S	St John Bapt. or Midsum. Day	toes	10	30	4		16	
25	A	5 Sunday after Trinity	head	10	45	5		6	
26	M	*More cool* S. John's C. Dr. El.	face	11	0	5		54	
27		*but inclined to Rain.*	neck	11	22	6		45	
28	V	Days 16 h. 19 min. long	thro.	11	52	7		38	
29	T	St. Peter and St. Paul	arms	Morn.		8		30	
30	F	Exeter College Election	shou.	0	28	9		24	

M D	Sun Rises.	Sun Sets.	Watch too fast.	Saturn Sets.	Jupiter Rises.	Mars Rises	Venus Sets.	Mercu. Sets
6	3 39	8 21	0 18	1M17	0M 5	9 N10	8 N25	9N 35
12	3 39	8 21	1 34	0 52	11N53	9 8	8 38	9 40
18	3 40	8 20	2 50	0 27	11 30	Sets.	8 44	9 28
24	3 44	8 16	3 57	0 6	11 6	2M 9	8 45	9 14
30	3 49	8 11	4 51	11N34	10 52	1 36	8 43	8 42

JULY hath XXXI Days.

			Day Breaks	Sun's Declin.
New Moon	3	Day at Noon	6 No real Night.	21 N 13
First Quarter	11	at 4 Afternoon	12	20 5
Full Moon	18	Day at 5 Afternoon	18 0 15	18 43
Last Quarter	25	Day at 7 in the Morn.	24 1 12	17 14
			31 1 43	15 13

		Some Weather for the	sho.	1	18	10		16
2	A	6 Sunday after Trinity	brea.	2	17	11		8
3		*Harvest at the beginning*	ſtom.	☽ Sets		12		0
4	T	☉ Due E. 7 h. 18 min.	heart	8	34	0	A	46
5	W	Days decreas'd and Nights	and	8	49	1		30
6	T	lengthen'd 35 min.	back	9	2	2		31
7	F	Thomas a Becket.	bow	9	14	2		53
8	S	*Some ſl,ing Showers*	belly	9	26	3		30
9	A	7 Sunday after Trinity	reins	9	37	4		12
10	M	*but very hot with*	and	9	50	4		54
11	T	☉ Due E 7h. 9 m. Alt. 26° 18′	loins	10	7	5		37
12	W	Days 15 hours 54 min. long.	ſecr.	10	21	6		26
13	T	*frequent Claps of Thunder*	blad.	11	0	7		18
14	F	*about this Time.*	hips	11	45	8		15
15	S	☽ within ☉ Ampl. 33°. 37′.	thig	Morn.		9		13
16	A	8 Sunday after Trinity.	kne.	0	46	10		17
17	M	*Still hot and*	ham.	2	0	11		17
18	T	Day 15 hours 36 min. long	legs	☽ Riſes		Morn.		
19	W	Dog-days begin	ank.	8	0	0	M	15
20	T	Margaret.	feet.	8	15	1		10
21	F	*perhaps Fog Mornings.*	toes	8	31	2		4
22	S	Days decreaſed and Nights	head	8	45	2		15
23	A	9 Sunday after Trinity	face	9	3	3		48
24	M	lengthened 1 hour 24 min.	neck	9	26	4		40
25	T	St. James Apoſtle.	and	9	52	5		38
26	W	Anne.	thro.	10	30	6		21
27	T	☉ Due E. 6h. 54m. Al. 21°. 16′.	arms	11	16	7		18
28	F	*Showery, with Thunder*	ſhou.	Morn.		8		12
29	S	*now and to the End.*	brea.	0	21	9		8
30	A	10 Sunday after Trinity.	ſtom.	1	10	9		56
31	M	Prs. Augusta born.	heart	2	30	10		45

M D	Sun Riſes.	Sun Sets.	Watch too faſt.	Saturn Sets.	Jupiter Riſes.	Mars Sets.	Venus Sets.	Mercu. Riſes.
6	3° 56	8 4	5 32	11 N 44	10 N 20	1 M 2	8 N 41	5 M 22
12	4° 3	7 57	5 53	11 19	9 56	12 N 35	8 35	4 52
18	4° 12	7 48	5 54	10 55	9 32	12 9	8 26	4 [illegible]
24	4 22	7 38	5 53	10 32	9 9	11 47	8 18	3 [illegible]
31	4 35	7 25	4 42	10 6	8 41	11 27	8 5	2 57

AUGUST hath xxxi Days.

	M D	Day Breaks.		Sun's Decl.	
New Moon 2 Day at 2 in the Morning	6	2	7	13	N
First Quarter 10 Day at 5 in the Morning,	12	2	29	11	
Full Moon the 16 Day at 12 at Night	18	2	49	9	
Last Quarter 23 Day at 3 Afternoon	24	3	7	7	
New Moon 31 Day at 8 at Night.	31	3	25	4	

1	T	Lammas Day	heart	3	41	11	29	
2	W	*Expect good Weather for*	back	☽ Sets		0	A	10
3	T	*the Harveſt at the*	bow	7	25	0		52
4	F	*beginning of this Month*	belly	7	37	1		23
5	S	Days 14 hours 24 min. long	reins	7	48	2		12
6	A	11 Sunday after Trinity	and	8	2	2		54
7	M	Days decreas'd 2 h. 15 min.	loin	8	17	3		36
8	T	☉ due East 6h. 42'. Alt. 16° 25'	ſecr.	8	37	4		22
9	W	*Now ſome flying Showers*	blad.	9	3	5		11
10	T	Laurence	hips	9	40	6		6
11	F	*with briſk Winds and*	and	10	31	7		0
12	S	Days 14 h. 5 min. long	thig.	11	40	8		
13	A	12 Sunday after Trinity	kne.	Morn.		9		2
14	M	*perhaps ſome Thunder*	ham	0	57	10		3
15	T	Days are now decreaſed, and	legs	2	24	10		58
16	W	Nights lengthened 2 h. 50 m	ankl	4	0	11		54
17	T	☉ due E. 6 h. 31' Al. 12° 27'	feet	Riſes		Morn.		
18	F	*A fine Seaſon for the*	toes	6	57	0		17
19	S	*Harveſt, but much Heat*	head	7	16	1		39
20	A	13 Sunday after Trinity	face	7	36	2		33
21	M	Athanaſius	neck	8	2	3		30
22	T	*Now perhaps ſome Showers*	thro'	8	36	4		23
23	W	*with Claps of Thunder.*	arms	9	18	5		17
24	T	St. BARTHOLOMEW the Ap.	ſho	10	14	6		14
25	F	*Still ſhowery with*	brea	11	16	7		8
26	S	Days ſhorten'd 3 h. 35 min.	and	Morn.		8		0
27	A	14 S. af. Trin. Dog Days end	ſton	0	28	8		49
28	M	Auſtin	hea	1	42	9		34
29	T	☉ Due E. 6. h. 17 m. Alt. 6°. 49'	back	2	52	10		17
30	W	*briſk Winds, to the End.*	bow	4	2	10		59
31	T	Days 12 h. 49 min. long	belly	5	10	11		41

M D	Sun Riſes.		Sun Sets.		Watch too faſt.		Saturn Sets.		Jupiter Riſes.		Mars Sets.		Venus Sets.		Mercu. Riſes.	
6	4	46	7	13	3	35	9 N	44	8 N	16	11 N	9	7 N	53	3	M 3
12	4	57	7	2	2	11	9	23	7	52	10	58	7	43	3	30
18	5	9	6	51	0	30	9	1	7	31	10	48	7	31	4	17
24	5	21	6	39	1 ſlow	20	8	40	7	9	10	41	7	21	5	0
31	5	35	6	25	3	40	8	16	6	43	10	32	7	6	5	51

SEPTEMBER hath xxx Days.

	M D	Day Breaks.	Sun's Declin.
First Quarter 8 at 5 Afternoon	6	3 42	2 11
Full Moon 15 Day at 8 Morning	12	3 56	0 S 10
Last Quarter 23 Day at 8 Morning	18	4 11	2 31
New Moon 30 Day at Noon	24	4 24	4 51
	30	4 37	7 9

1	F	*Now expect good*	belly	6	4	0 A	21
2	S	LONDON burnt 1666	reins	6	18	1	1
3	A	15 Sunday after Trinity	loins	6	33	1	46
4	M	*Weather for the Harveſt*	ſecr.	6	53	2	27
5	T	☉ Due E. 6 h. 8 m. Alt. 30 20′.	*Cods*	7	18	3	17
6	W	Days decreas'd and Nights in-	blad	7	58	4	8
7	T	creas'd 4 hours 20 min.	hips	8	36	5	4
8	F	Nat. V. Mary	thig.	9	38	6	0
9	S	*Windy and not much wet*	kne	10	50	6	57
10	A	16 Sunday after Trinity	ham	Morn.		7	52
11	M	☾ in ♋ at 32 m. paſt 2 Morn.	legs	0	13	8	50
12	T	Equal Day and Night in all the	ankl.	1	42	9	46
13	W	habitable Parts of our Globe	feet	3	7	10	42
14	T	Holy Rood Day	toes	4	43	11	33
15	F	*Still windy, and now*	head	Riſes		Morn.	
16	S	*we may well expect*	face	5	50	0	27
17	A	17 Sunday after Trinity	neck	6	13	1	21
18	M	Day 11 h. 32 min. long	thro.	6	46	2	16
19	T	*ſome flying Showers*	arms	7	25	3	15
20	W	Ember Week	and	8	16	4	13
21	T	S. MATTHEW Apoſtle & Evan.	ſho.	9	16	5	10
22	F	*Now and for ſeveral*	brea.	10	27	6	3
23	S	Days now ſhortened 5 h. 32 m.	ſtom	11	34	6	54
24	A	18 Sunday after Trinity	hear	Morn.		7	41
25	M	*Days expect very good*	back	0	53	8	24
26	T	*Weather to finiſh the Harveſt*	bow	2	2	9	7
27	W	Now the Days are decreaſed and	belly	3	12	9	47
28	T	Nights increaſed 5 h. 47 min.	*guts*	4	19	10	26
29	F	St. MICHAEL the Archangel	reins	5	29	11	7
30	S	*Perhaps Showery at the End.*	loins	6	32	11	58

M D	Sun Riſes.	Sun Sets.	Watch too ſlow	Saturn Sets.	Jupiter Sets.	Mars Sets.	Venus Sets.	Mercu. Sets.
6	5 48	6 12	5 49	7 N 56	5 M 39	10 M 28	6 N 56	6 N 29
12	6 0	6 0	7 50	7 35	5 12	10 25	6 46	6 18
18	6 13	5 46	9 51	7 15	4 46	10 24	6 36	6 9
24	6 25	5 35	11 41	6 54	4 20	10 22	6 26	5 58
30	6 38	5 22	13 18	6 32	3 54	10 21	6 17	5 46

OCTOBER hath xxxi Days.

M D	Day Breaks	Sun's Dec.
First Quarter 8 Day at 3 in the Morning	6 4 49	9 31
Full Moon 14 Day at 6 at Night	12 5 06	11 3
Last Quarter 22 Day at 2 in the Morning	18 5 11	13 3
New Moon 30 Day at 5 in the Morning	24 5 22	15 3
	31 5 32	17 3

1	A	19 Sunday after Trinity	feet.	5	10	0 A37
2	M	Days now dec. and Nights in-	and	5	33	1 22
3	T	creased 6 hours 12 minutes	blad.	6	2	2 15
4	W	*Warm and pleasant*	hips	6	33	3 7
5	T	*at the beginning, but*	thig.	7	37	4 2
6	F	St. **Faith.**	kne.	8	46	5 0
7	S	*perhaps some frosty Mornings*	ham	10	8	5 55
8	A	20 Sund. after Trinity.	legs	11	29	6 48
9	M	St. Dionisius	and	Morn.		7 44
10	T	**Dst.** and **Camb.** Terms begin	ank.	0	54	8 55
11	W	King George II. Crowned	feet	2	21	9 26
12	T		toes	3	51	10 19
13	F	Days 9 hours 53 min. long	head	5	17	11 12
14	S	*Windy with Rain*	face	☽ Rises		Morn.
15	A	21 Sunday after Trinity	neck	4	44	0 8
16	M	Days are now shorter and	thro.	5	25	1 4
17	T	Nights lengthened 7 h. 4 min.	arms	6	10	2 4
18	W	St. Luke the Evangelist	shou	7	8	3 0
19	T	Days 9 hours 36 min. long	brea.	8	15	4 0
20	F	Tres Mich. 1 Return	stom	9	26	4 52
21	S	Ursula	heart	10	39	5 42
22	A	22 S. aft. Trin. Prs. of Or. b	and	11	53	6 25
23	M	Michaelmas Term begins	back	Morn.		7 8
24	T	*Still windy, but not unpleasant*	bow	1	2	7 49
25	W	**Crispin**	belly	2	10	8 28
26	T	Days 9 h. 19 min. long.	reins	3	20	9 10
27	F	Mens. Mich. 2 Return	and	4	30	9 49
28	S	St. Simon and Jude Apostles	loins	5	42	10 34
29	A	23 Sunday after Trinity	feet.	6	55	11 19
30	M	K. George II. born 1683	blad.	☽ Sets		0 10
31	T	Days 8 h. 40 m. long	hips	4 A44		1 A 2

M D	Sun Rises.	Sun Sets.	Watch too slow	Saturn Sets.	Jupiter Sets.	Mars Sets.	Venus Sets.	Mercu. Sets.
6	6 50	5 9	14 39	6 N 12	3 M 29	10 N 21	6 N 10	5 N 35
12	7 3	4 57	15 36	5 52	3 5	10 23	6 6	5 24
18	7 15	4 45	16 18	5 29	2 38	10 25	6 2	5 12
24	7 26	4 34	16 13	5 8	2 13	10 25	6 3	4 57
31	7 40	4 20	15 41	4 41	1 43	10 25	6 6	4 29

NOVEMBER hath xxx Days.

First Quarter 6 Day at 11 in the Morn.
Full Moon 13 Day at 6 in the Morn.
Last Quarter 20 Day at 11 at Night
New Moon 28 Day at 8 at Night

M D	Day Break	Sun's Decl.
6	5 14	19 6
12	5 52	20 27
18	5 58	21 38
24	6 2	22 28
30	6 6	23 4

1	W	All Saints	thig.	5 34	1 A	58
2	T	All Souls	kne.	6 35	2	55
3	F	Gr. Ani. 3. R. All S. Col. E.	and	7 55	3	51
4	S	*Cold Rain Sleet or Snow*	ham	9 16	4	47
5	A	Gun Powd. Plot. 24 S. aft. Trin.	legs	10 40	5	38
6	M	Day 8 hours 20 min. long	aukl	Morn.	6	28
7	T	*with rough Winds*	feet	0 5	7	17
8	W	Days decreased and Nights	toes	1 28	8	7
9	T	increased 8 hours 30 min.	head	2 49	8	57
10	F	*Cold and tempestuous*	and	4 21	9	52
11	S	Martin Bishop of Tours	face	5 48	10	47
12	A	25 Sunday after Trinity	neck	7 10	11	44
13	M	Craft. Mart. 4 Return	thro.	☽ Rises	Morn.	
14	T	Prince WILL. HEN. born	arms	4 49	0	42
15	W	Day 8 hours 10 min. long	sho.	5 54	1	38
16	T	*Frosty and Cold*	brea.	7 4	2	34
17	F	*a Winter like Season*	stom	8 18	3	25
18	S	Octab. Mar. 5 Ret.	heart	9 31	4	14
19	A	26 S. aft. Trin. Prs. of W. born	back	10 42	4	57
20	M	Days decreased, and Nights in-	bow.	11 56	5	39
21	T	creased 9 h. one Quarter	belly	Morn.	6	17
22	W	Cecilia V. and Martyr. An. 225	*guts*	1 2	6	57
23	T	Clement	reins	2 7	7	39
24	F	Days 7 h. 34 min. long	loins	3 17	8	22
25	S	Catharine Quin. Mar. 6 Ret.	secr.	4 42	9	13
26	A	27 Sunday after Trinity..	blad.	5 45	9	52
27	M	*More pleasant towards the End.*	hips	6 57	10	44
28	T	Term Ends	and	☽ Sets	11	39
29	W	*perhaps moderate Frost*	thig.	4 16	0 A	36
30	T	St. ANDREW Apostle	kne.	5 28	1	34

M D	Sun Rises.	Sun Sets.	Watch too slow	Saturn Rises.	Jupiter Sets.	Mars Sets.	Venus Sets.	Mercu. Rises.
6	7 50	4 10	14 40	7 M 28	1 M 20	10 N 25	6 N 13	7 M 1
12	7 59	4 1	13 10	7 7	0 55	10 25	6 23	6 12
18	8 7	3 53	11 13	6 46	0 30	10 24	6 35	5 57
24	8 13	3 47	8 50	6 24	0 7	10 24	6 50	6 11
30	8 18	3 42	6 8	6 0	11 N 40	10 24	7 4	6 28

DECEMBER hath XXXI Days.

	M D	Day breaks	Sun's Decl.
First Quarter 5 at 7 at Night	6	5 4	23 2
Full Moon 12 Day at 8 at Night	12	6 3	23 3
Last Quarter 20 at 8 at Night	18	6 2	23 1
New Moon 28 Day at 9 Morn.	24	6 0	22 4
	31	5 57	21 5

1	F	*Now winterly Weather with*	ham	6	51	2	30	
2	S	*cold short Days.*	legs	8	16	3	23	
3	A	Advent Sunday.	ankl.	9	34	4	15	
4	M	*and deep dirty Roads*	feet	11	4	5	4	
5	T	*may well be expected.*	toes	Morn.		5	54	
6	W	Day 7h. 18m. Night 16h. 42 lo	head	0	27	6	44	
7	T	Princess of DENMARK born	face	1	52	7	33	
8	F	Greatest decrease of the Days	neck	3	14	8	25	
9	S	at Nottingham 9 h. 25 min.	taro.	4	39	9	19	
10	A	2 Sunday in Advent	arms	5	57	10	16	
11	M	☉ in ♑ 10 Day 5 h. 28 m. P.M.	and	7	10	11	12	
12	T	Moon Ecl. 8 h. 7 m. Even Vi.	sho.	☽ Rises		Morn.		
13	W	Shortest Day at NOTTINGHAM	brea.	4	30	0	10	
14	T	7 hours 18 min. long	stom	5	46	1	3	
15	F	Days increased minutes	heart	7	0	1	42	
16	S	*Cold Winds with driving*	back	8	11	2	37	
17	A	3 Sunday in Advent	bow	9	21	3	20	
18	M	*Snow Sleet or Rain*	guts	10	27	4	0	
19	T	Days increas'd 6 minutes	belly	11	37	4	41	
20	W	Ember Week	reins	Morn.		5	21	
21	T	St. THOMAS Apostle	loins	0	46	6	2	
22	F	*Still very cold and perhaps*	secr.	1	53	6	46	
23	S	*much inclin'd to wet*	blad.	3	7	7	31	
24	A	4 Sunday in Advent	*cods*	4	19	8	21	
25	M	CHRISTMAS Day	hips	5	32	9	13	
26	T	St. STEPHEN Proto-Martyr	thig.	6	31	10	9	
27	W	St. JOHN Evangelist	knee	7	23	11	8	
28	T	Innocents, or Herod's Murd. Inf.	ham	Sets		0 A	6	
29	F	*Now more Frosty to the End.*	legs	5 A	37	1	1	
30	S	Princess ELIZABETH born	ankl	7	7	1	56	
31	A	1 Sunday after Christmas	feet	8	36	2	46	

M D	Sun Rises.	Sun Sets.	Watch too slow	Saturn Rises.	Jupiter Sets.	Mars Sets.	Venus Sets.	Mercury Rises.
6	8 21	3 39	3 15	5 M 37	11 N 18	10 N 22	7 N 20	6 M 58
12	8 21	3 39	0 12	5 1[illegible]	10 56	10 21	7 33	7 24
18	8 20	3 40	2 fa. 45	4 52	10 34	10 21	7 49	7 45
24	8 15	3 45	5 36	4 29	10 13	10 20	8 5	8 4
31	8 9	3 51	8 3	4 [illegible]	9 40	10 18	8 20	8 18

TABLE of all the Kings and Queens of *England* since the Conqueſt.

The Year of the Birth of each King and Queen; alſo the Year, Month, and Day, whereon they began to reign: beginning the Year the firſt Day of January, 1748.			The Length of each Reign.			The Years expired ſince each Reign began and ended.	
Names.	Born.	Began to Reign.	Y.	M.	D.	Beg.	End.
William Conq.	1027	1066 October 14	20	10	21	683	662
William Rufus	1057	1087 Septem. 9	12	10	24	662	649
Henry I.	1058	1100 Auguſt 2	35	4	6	649	606
Stephen	1105	1135 Decem. 1	18	10	24	606	595
Henry II.	1134	1154 October 25	34	8	11	595	560
Richard I.	1156	1189 July 6	9	9	0	560	550
John	1166	1199 April 6	17	6	13	550	533
Henry III.	1207	1216 October 19	56	1	0	533	477
Edward I.	1239	1272 Novem. 16	34	7	21	477	442
Edward II.	1284	1307 July 7	19	6	13	442	422
Edward III.	1312	1327 January 20	50	5	1	422	372
Richard II.	1366	1377 June 21	22	3	8	372	350
Henry IV.	1367	1399 Septem. 29	13	5	21	350	336
Henry V.	1389	1413 March 20	9	5	11	336	325
Henry VI.	1421	1422 Auguſt 31	38	6	4	325	288
Edward IV.	1442	1461 March 4	22	1	5	288	266
Edward V.	1471	1483 April 9	0	2	13	266	266
Richard III.	1443	1483 June 22	2	2	0	266	264
Henry VII.	1457	1485 Auguſt 22	23	8	0	264	240
Henry VIII.	1492	1509 April 22	37	9	6	240	202
Edward VI.	1537	1547 January 28	6	5	8	202	196
Mary I.	1516	1553 July 6	5	4	11	196	191
Elizabeth	1533	1558 Novem. 17	44	4	7	191	146
James I.	1566	1603 March 24	22	0	3	146	124
Charles I.	1600	1625 March 27	23	10	3	124	100
Charles II.	1630	1649 January 30	36	0	7	100	64
James II.	1633	1685 February 6	4	0	7	64	60
Mary II.	1662	1689 Feb. 13	5	10	15	60	55
William III.	1650		13	0	23	60	47
Anne	1665	1702 March 8	12	4	24	47	35
George I.	1660	1714 Auguſt 1	12	10	10	35	22
George II.	1683	1727 June 11	whom God preſerve.				

A Compendious TABLE of INTEREST,

Shewing the Interest of any Sum of Money, from a Million to a Pound; for any Number of Days, at any Rate of Interest.

No.	l.	s.	d.	q.
1000000	2739	14	6	0,99
900000	2465	15	0	3,29
800000	2191	15	7	1,59
700000	1917	16	1	3,89
600000	1643	16	8	2,19
500000	1369	17	3	0,49
400000	1095	17	9	2,79
300000	821	18	4	1,09
200000	547	18	10	3,40
100000	273	19	5	1,70
90000	246	11	6	0,32
80000	219	3	6	0,96
70000	191	15	7	1,59
60000	164	7	8	0,22
50000	136	19	8	2,85
40000	109	11	9	1,48
30000	82	3	10	0,11
20000	54	15	10	2,74
10000	27	7	11	1,37
9000	24	13	1	3,23
8000	21	18	4	1,10
7000	19	3	6	2,96
6000	16	8	9	0,82
5000	13	13	11	2,58
4000	10	19	2	0,55
3000	8	4	4	2,41
2000	5	9	7	0,27
1000	2	14	9	2,14

No.	l.	s.	d.	q.
1000	2	14	9	2,14
900	2	9	3	3,22
800	2	3	10	0,11
700	1	18	4	1,10
600	1	12	10	2,80
500	1	7	3	0,98
400	1	1	11	0,50
300	0	16	5	1,40
200	0	10	11	2,30
100	0	5	5	3,01
90	0	4	11	0,71
80	0	4	4	2,41
70	0	3	10	0,11
60	0	3	3	1,81
50	0	2	8	3,51
40	0	2	2	1,21
30	0	1	7	2,00
20	0	1	1	0,60
10	0	0	6	2,30
9	0	0	5	3,67
8	0	0	5	1,40
7	0	0	4	2,41
6	0	0	3	3,76
5	0	0	3	1,15
4	0	0	2	2,52
3	0	0	1	3,80
2	0	0	1	1,26
1	0	0	0	2,63

RULE.

Multiply the Sum by the Number of Days; and that Product by the Rate per Cent. Then cut off the two last Figures to the right Hand, and the rest you must find in the Table.

Example. What is the Interest of 100 l. for 365 Days at 5 per Cent?

No. of Days 365
multiply by 100
Product 36500
multiply by 5 Rate p. Cent.
1825100

Then in the Table
against 1000 is 2 14 9 2,14
800 2 3 10 0,11
20 0 1 1 0,60
5 0 0 3 1,15
Answ. 5 0 0 0,00

By Mr *John Hollingworth.*

To oblige you, and my Countrymen, once more
I've taken Pen in Hand as heretofore;
And by a tedious Perambulation,
Have follow'd Sun and Moon thro' ev'ry Nation:
Then give me leave, kind Sirs, to make appear,
When either will Eclipsed be, this Year.

There will be five Eclipses this Year; three of the Sun, and two of the Moon; they happen in the following Order.

The first is of the Sun, on *Saturday* the 7th of *January*, about Seven at Night, invisible.

The second is of the Moon, on *Monday June* 19, about 9 in the Morning, invisible.

The third is of the Sun, on *Monday July* 3, nearly about Noon, but invisible.

The fourth is a visible Eclipse of the Moon, on *December* 12, in the Evening.

	Begin.			Middle			End			Durat.			Digits		
Apparent Time at London	h	′	″	h	′	″	h	′	″	h	′	″	°	′	″
Eclipse. Dec. 12 in the Even.	6	58	48	8	6	59	9	14	53	2	16	5	4	32	0

This Eclipse will be seen (if the Air permits) by some of the Natives in all the four Quarters of the World; she Rises Eclips'd in the Gulph of *St Lawrence*, and Sets in the middle of her Eclipse at *Terra de Papos*.

The fifth Eclipse is a visible one of the Sun, on *Thursday December* 28, in the Morning, and according to apparent Time at *Furneaux Pelham*, begin *Dec.* 28. at 8 h. 6′ 20″ in the Morning, greatest Darkness at 9 h. 14′ 8″, and ends 10 h. 26′ 40″. Total durat. 2 h. 20′ 20″, and Digits Eclipsed 7° 10′ 8″.

The principal Appearances will happen as below:

Place.	Lat.			Long.			Appearance.	Time.	
In Ethiopia	14	0	S	24	0	W	Eclipsed at Rising	7 6	per Lead-
St. Domingo	31	58	S	50	46	W	Centrally at Rising	8 30	better's
Barbara	26	4	N	15	2	E	In the Nonagesima	9 36	*Tables*,
Red Sea	28	0	N	31	57	E	In the Meridian	9 52	by *John*
South Sea	54	15	S	144	19	E	Cent. Ecl. at sett.	10 46	*Holling-*
Holland nova	37	56	S	109	12	E	Eclipse ends	11 59	*worth.*
N. Greenland	86	58	N	32	0	E	Sun's lower Limb touch'd by Mo. up.		
Zimlas	10	25	S	52	0	E	Sun's up. Limb touch'd by Mo. lower		

We have also received an Account of the *Times*, *Places*, &c. of the said Eclipses, from several other of our ingenious *Correspondents*, as exhibited in the following Tables.

Moon Ecl. Dec. 12 at Night	Ap. time	Beg. h	Beg. m	Mid. h	Mid. m	End h	End m	Dur. h	Dur. m	Dig.
Mr. Rob. Robinson	London	6	47	7	58	9	10			
	Newcastle	6	41	7	52	9	4	2	23	35
	Madrid	6	34	7	45	8	57			
Mr. Tho. Sparrow, Mansfield		6	56	8	4	9	12	2	16	41
Mr. Tho. Cowper, Wellingborough, by Brent's Tables		6	52	8	1	9	10	2	18	44
Mr. Alexander Man	London	6	56	8	8	9	20			
	Pool	6	49	8	1	9	13	2	24	56
	Exeter	6	42	7	54	9	6			
Mr. Thos. Allen, London		6	57	8	9	9	20	2	23	38
Mr. Benj. Donn	London	6	54	8	5	9	16			
	Bideford	6	37	7	47	8	58	2	22	50
Mr. Samuel Sector, London		6	53	8	4	9	16	2	24	51

Sun Ecl. Dec. 28 Morn.	Ap. time	Beg. h	Beg. m	Mid. h	Mid. m	End h	End m	Dur. h	Dur. m	Dig.
	Capt. Howard York.	7	0	8	11	9	23			
Mr. Foxton	Rome	7	55	9	7	10	19			
	Surat in India	11	51	1	33	3	15	2	23	1
	Barbados	3	10	4	22	5	34			
Mr. William Whalhead, Newark		6	34	8	3	9	12	2	18	40
Mr. William Mobbs, Heath		6	56	8	3	9	11	2	16	35
Mr. Jos. Walker, Kettering		6	52	8	1	9	10	2	18	42
Mr. Temple, London, by Leadb. Ta.		6	48	7	59	9	11	2	23	3
Philolautheros	London	6	49	7	57	9	5			
	Lands End	6	29	7	33	8	41	2	12	35
	Witton le Wear	6	52	8	2	9	12			
Mr. John Brown	London	6	58	8	8	9	11			
	Great Musgrave	6	51	8	1	9	11	2	20	35
	Etherly	6	52	8	2	9	12			
Mr. R. Hulse for London		6	59	8	8	9	16	2	17	5

☉ Ecl. Dec. 28 Morn. Appar. time										
Mr. Tho. Sparrow, Mansfield		8	2	9	9	10	21	2	19	7
Mr. Ralf Agas, London		8	6	9	12	10	23	2	16	7
Mr. Rob. Robinson, Stockton		8	1	9	5	10	7	2	6	2
Mr. Temple, Lond. by Leadb. Tab.		8	4	9	11	10	22	2	18	7
Mr. John Brown, Witton le Ware		8	4	9	10	10	16	2	12	7
Mr. Will. Caile	Great Musgrave	8	3	9	9	10	15			
	Etherley	8	4	9	10	10	16	2	12	7
Mr. Jos. Walker, Kettering		8	2	9	8	10	18	2	16	6
Mr. William Mobbs, Heath		8	1	9	10	10	23	2	18	7
Mr. William Foxton, Hovingham		8	4	9	16	10	24	2	20	6
Mr. Samuel Sector, London		8	5	9	10	10	24	2	19	6
Mr. Benj. Donn, Bideford		7	38	8	43	9	55	2	17	6

		Beg. h	m	Mid. h	m	End. h	m	Dur. h	m	Dig.	Vm
Mr. Tho. Allen	London	8	03	9	28	10	18	2	15	6	44
Mr. Alex. Mann	London	8	0	9	5	10	12	2	12	6	37
	Poole	7	54	8	58	10	8	2	14	6	40
	Exeter	7	48	8	50	9	57	2	9	5	42
Mr. Cowper	Northamp. by Brent's t.	8	2	9	8	10	18	2	16	6	46
Mr. John Harvey	St. Ives Cornw.	7	49	8	54	10	3	2	14	7	26

There will likewise happen an Occultation of *Cor Scorpionis* by the Moon *March* 27, about one in the Morning.

The Ap. Time at *Lond.* of the { Ingress. *Mar.* 26, 12h 53′ P.M. / Egress. 27. 2h 4 Morn.

per Mr. Tho. Cowper.

Mr. *Sellar* hath likewise taken Notice of the said Occultation, and favoured us both with the Calculation and a Type thereof; which for want of Room must be omitted.

Answers to the MATHEMATICAL Questions of 1748.

Question the 71 answered by Mr *John Todd.*

Put $a = An$, $b = Be$, $c = Cd$, $x = AC$, and $y = BC$ (per Fig. in last Year's Diary) Then $x - c = Ad$. $y - b = Ce$. $\sqrt{x^2 - a^2} = Cn$, and $\sqrt{y^2 - c^2} = Bd$; and per similar As $a : \sqrt{x^2 - a^2} :: x - c : \frac{x-c}{a}\sqrt{x^2 - a^2} = \sqrt{y^2 - c^2}$, also as $c :: y - b : \frac{y^2 - by}{c} = x$, which put for x, in the other Equation, and we have $\frac{y^2 - by - c^2}{ac}\sqrt{y^2 - by - a^2 - c^2} = \sqrt{y^2 - c^2}$

In which Equat. y is $= 9 = BC$, hence $AC = 10$, $AB = 8$, and the Area $= 34.497$ Square Chains $= 3$ A. 1 R. $27\frac{1}{2}$ Perches.

Mr *Rob. Robinson* solves the same thus:

Let $An = 5.1875 = a$, $Be = 2.5 = b$, $Cd = 5.85 = c$, and $Ce = v$. Then per Sim. Δs $n : m + v :: v : AC = \frac{mv + v^2}{}$

$\frac{mv+v^2}{n}$; $\therefore Ad = \frac{mv+v^2-n^2}{n}$, and $a : \frac{mv+v^2}{n} :: \frac{mv+v^2}{n} : \frac{mv+v^2-n^2}{n}$; $AB = \frac{mv+v^2 \times mv+v^2-n^2}{an^2}$ $\therefore B = \frac{mv+v^2 \times mv+v^2-n^2}{an^2} : -a$. Again $m : \frac{mv+v^2 \times mv+v^2-n^2}{an^2} - a :: m+v$; and multiplying Extreams and Means we have $v^7 + 3mv^6 + 3m^2 - 2n^2 \times v^5 + m^3 - 4mn^2 \times v^4 + n^4 - n^2 n^2 - 2m^2 n^2 \times v^3 + mn^4 - ma^2 n^2 \times v^2 + a^2 n^4 v = ma^2 n^4$, Solv'd $v = 6,5$; hence the Sides are $BC = 9$, $AB = 8$, $AC = 10$ Chains, and the Area $= 3$ A. 1 R. 27,15 P.

The Propoſer, Mr William Sutton, *favoured us with a neat and elegant Solution to this Queſtion, which, for want of Room, were obliged to omit, with many other valuable Productions of his, and our other ingenious Contributors.*

Mr *Tho. Moſs* ſolves it thus:

Put $An = a$, $Be = b$, $Cd = d$, $Ce = x$ and $Bn = y$. Then ſince the As BnC, and AeB are ſimilar, the Angle at B being common to both, it will be as $Bn : BC :: Be : BA$ (*i. e.*) $y : b + x :: b : a + y$ $\therefore b^2 + bx = ay + y^2$, but ſince $x = \frac{ay + y^2 - b^2}{b}$ and $y = \sqrt{b^2 + bx + \frac{a^2}{4}} - \frac{a}{2} - x$ therefore by ſubſtituting for x its equal, in the laſt Equation, it becomes $y + \frac{a}{2} = \sqrt{\frac{by^2 + ba^2y^2 - b^5}{b^2} + b^2 + \frac{a^2}{4}}$ or $\frac{2y+a}{2} = \frac{by^2 + ba^2y^2 - b^5}{b^2} + b^2 + \frac{a^2}{4}$ $\therefore 4by^2 + 4ba^2y = 4b^5 + 4a^2y + y^4 - 4b^4$, $\therefore y^4 - by^2 - ba^2y + a^2y = b^4 - b^5$, from whence the Value of y is determin'd $= 2,8125$, and of $x = 6,5$. Again, (per ſim. Triangles) as $Cd : BC :: Ce : AC = 10$, and the other two Sides are (as found above) $AB = 8$, $BC = 9$, conſequently the Area $= 3$ A. 1 R. 27,15 P.

This

This Question was truly and ingeniously solv'd by Mr. Per-yam, Mr. Cowper, Mr. Kingston, Mr. Bevil, and several others; as may be seen in the Catalogue at the End of the Book.

Question 72 answer'd by Mr. *Rob. Robinson.*

There is given VB = 40 = m, 1,8125 = n; and let the Parameter = a, VC = x, D⊙ = B⊙ = y, BA = v; then the Subnormal C⊙ = $\frac{1}{2}a = m - x - y$ ∴ $x = m - y - \frac{1}{2}a$; and *per* sim. Triangles as $y : \frac{1}{2}a :: \frac{1}{2}a + 2x : y$ ∴ $x = \frac{a}{4} - \frac{v^2}{a} = m - y - \frac{1}{2}a$; hence $\frac{v^2}{a} = y = \frac{v^2}{2m}$. Again,

Let z = AE = EV, then BE = $m - z$, and $v^2 + m - z)^2 = z^2$;

hence $z = \frac{m^2 + v^2}{2m}$, and *per* Quest. $v = \frac{v^2}{2m} \times n = \frac{m^2 + v^2}{2m}$,

$\frac{2mn}{n+1}v + \frac{m^2}{n+1} = 0$, Solv'd $v = 16$ or $35\frac{5}{9}$.

Hence the { Ordinate ABA = 32 / Diam. of the inscrib'd Circle = 25,6 / Diam. of circumscrib. Circle = 46,4 } or { 71 / 39 / 71 }

The same answered by Mr. *Anth. Baker.*

Let VB = 40 = b, 1,8125 = n, VC = x; Then by the Property of the Parabola $ax)^{\frac{1}{2}} = DC$, and the Subtangent is = $2x$. Hence per sim. Triangles, $2x : ax)^{\frac{1}{2}} :: ax)^{\frac{1}{2}} : \frac{1}{2}a = C⊙$ $\sqrt{a^2 + 4ax} = ⊙D = ⊙B = b + \frac{1}{2}a - x$. Again, by the Property of the Parabola $ab = BA^2$, and by the Nature of the Circle $b \times BL = BA^2$, also, $\frac{1}{2}a = BL$, and *per* Quest. $a \times b - \frac{1}{2}a - x = EV = EA = EL = \frac{a+b}{2}$; Hence

$\frac{2an - aa - b}{2n} = \frac{a+b}{2}$ (because $n \times \frac{1}{2}\sqrt{a^2+4x} = \frac{a+b}{2}$.) Then by reducing this Equat. and substituting $c = 2bn^2 - bn - b$, and $d = 1 + n^2$, we have $a = \frac{c \pm \sqrt{c^2 - b^2 d}}{d}$ where a hath two Values, either of which will solve the Prob. for a is either $= 6{,}4$ and then the Ordinate ABA is $= 3{,}2$, the Rad. of the circum. Circle EA $= 3{,}2$, and the Rad. of the inscrib. Circle ⊙B $= 12{,}8$; or else a is $= 31{,}66495$, in which Case ABA $= 71.11112$, EL $= 35.80247$, and ⊙B $= 19{,}753$.

Mr. *Thos. Perryam's* Solution is as follows:

Put $x = 40 =$ the Axis, $2y =$ the greatest Ordinate, and $y = 1{,}8125$. Then $\frac{y^2 + x^2}{x} =$ the Diameter of the circum. Circle, and $2y - \frac{y^2}{x} =$ the Diameter of the inscrib'd Circle; and *per* Quest. $2py - \frac{py^2}{x} = \frac{y^2 + x^2}{x}$; reduced and solv'd $y = \frac{px + x\sqrt{p^2 - p - 1}}{p+1} = 16$, hence $2y = 32$, $\frac{y^2 + x^2}{x} = 46{,}4$, and $2y - \frac{y^2}{x} = 25{,}6$. *W. W D.*

A great Number of our ingenious Contributors sent us Solutions to this Question, as Mr Moss, Mr Todd, Mr Sharp, Mr Kingston, Mr Sutton, Mr Wade, Mr Bevil, Mr Terey, Mr Dyer, Mr Harison, *and others.*

Question 73 answer'd by the Proposer Mr *Cooper.*

Put $a = 3{,}75$, $b = 4000$, $t = 2240$, the Pounds in a Ton W^t, and let $x =$ the Distance of the Mine from the Earth's Centre. Now the Force of Gravity or Weight of Bodies beyond the Earth's Surface being reciprocally as the Squares of the Distances, therefore it will be as $\frac{b^2}{x^2 + 2ax + a^2}$: : t : : $\frac{bbt}{x^2 + 2ax + a^2} =$ the Weight of a Ton on the Top

of the Mountain; and as Gravity decreases from the Surface of the Earth towards the Centre directly as the Distance increases, we have the following Proportion; as $r : t :: x :$ the Weight of a Tun in the Mine; but $\frac{4x - r4}{r} =$ $\frac{tx^2}{x^2 + 2ax + a^2}$; or $tx^3 + 2atx^2 - arx^2 + ta^2x = 2a^2rx = r^4 +$ r^3, this reduced gives $x = 3999.73517$, whence the Depth of the Mine is $= 0,26483$, and the Mountain's Height $= 3,48517$ Miles,

And the { at the Bottom of the Mine = 2239,85171 } lib.
Weight { at the Top of the Mount = 2236,10171 } Averd.

The same answer'd by Mr *Rob. Robinson*.

Let one Tun $= 2240$ *Lib.* $= a$, $3,75$ *Lib.* $= m$, the Earth's Radius $= 4000$ Miles $= r$, $3,75$ Miles $= n$, and put $x =$ the Distance of the Mountain's Top from the Earth's Centre; Then $x - n =$ Distance of the Earth's Centre from the Bottom of the Mine; and by the *Principia*, Vol. ii. p. 229.

$r : a :: \frac{ax - an}{r} =$ the Weight at the Bottom of the Mine;

and as $x^2 : a :: r^2 : \frac{ar^2}{x^2} =$ the Weight at the Mountain's Top; whose Difference $\frac{ax - an}{r} - \frac{ar^2}{x^2} = m$. $x^3 - nx^2 = \frac{mr}{a}$ $xx^2 = r^3$; solv'd $x = 4003,845175458$ } Therefore
The Depth of the Mine $= 0,26482405 42$ } Miles;
The Height of the Mount $= 3,48517594 58$ }

And the { at the Bottom of the Mine = 2239,85169 8 } lib.
Weight { at the Top of the Mount = 2236,10169 8 } Averd.

Mr. *Tho. Moss* solves the same as below.

Put $a = 2240$ *Lib.* $b = 3,75$ *Lib.* $d = 4000$ Miles, $c = 3,75$ Miles, and $x =$ the Depth of the Mine, and $c - x =$ the Altitude of the Hill above the Surface of the Earth; then because the Weights of equal Bodies above the Surface are reciprocally as the Squares of the Distances from the Earth's Centre; it will be as $d + c - x)^2 : d^2 :: a : \frac{ad^2}{d + c - x)^2}$ from whence

the Altitude of the Hill is found $= 3,485176$ } Miles.
And the Depth of the Mine $= 0,264824$ }

Now to find the Weight at the Bottom of the Mine, put $e = 0{,}264824$; then it will be as $d : d :: d - e : \frac{d^2 - de}{d} =$ 2239,8517 *Lib.* Averd. = the Weight at the Bottom of the Mine; consequently the Weight at the Top of the Mount will be = 2236,1017 *Lib.* Averdupoize.

The same answer'd by Mr. *Anth. Baker.*

Put $r = 4000$, $h = 3{,}75$ Miles, $d = 3{,}75$ *Lib.* $w = 2240$ *Lib.* and x = Distance between the Earth's Centre and Top of the Mountain; Then because the Weight of a Body placed between the Earth's Surface and its Centre, is in the direct simple Ratio of its Distance from the Centre; and that of a Body plac'd above the Earth's Surface is in the reciprocal duplicate Ratio of the said Distance; therefore it will be, as $r : x - h :: w : \frac{wx - wh}{r} =$ the Weight at the Bottom of the Mine; and as $x^2 : r^2 :: w : \frac{r^2 w}{x^2} =$ the Weight at the Top of the Mount; hence *per* Quest. $\frac{wx - wh}{r} = \frac{r^2 w}{x^2} + d$, Reduc'd $x^3 - \frac{dr + hw}{w} x^2 = r^2$. Solv'd $x = 4003{,}48516$; consequently the Depth of the Mine = 0,26484, and the Height of the Mountain = 3,48516; also

the Weight at { the Bottom of the Mine = 2239,852 / the Top of the Mount = 2236,102 } *Lib.*

Mr Perryam, *Mr* Wade, *Mr* Sutton, *Mr* Atkin, *Mr* Sharp, *and several others, sent us true Solutions to this Question.*

Question 74 solv'd by Mr. *Rob. Robinson.*

Let $5x$ = the Bung Diameter, $5y$ = Length, then $3x$ = the Head Diameter, and $3y$ = the Diagonal BF, hence $BC = 4x$, and (*per* 47 E. 1.) $9y^2 = 16x^2 + \frac{25x^2}{4}$ $\therefore 5y = \frac{40}{\sqrt{11}} x = 6x$, then will the Content be $\frac{287x^3}{5} \times \frac{4x}{882{,}35} = \frac{4414{,}754}{287x^2} = 126 = q$, hence $x = \sqrt{\frac{4414{,}754}{287x^2}} =$

$= 7.43557$; hence the Length $= 65.55553$, Bung Diam. $= 27.17785$, and the Head Diameter $= 16.30671$ Inches.

Mr *William Sutton* solves it thus:

Let $x =$ the Head Diameter, and $\frac{3}{5}x =$ that at the Bung, then will $BG = \frac{4}{5}x$; Let $y =$ the Diagonal BF; and (*per* 47. 1.) $2\sqrt{y^2 - \frac{16}{25}x^2} =$ the Length AC or FE; Therefore $x = \sqrt{4y^2 - 7.111111x^2}$, which reduced gives the Value of y, from whence the Length is $= 4.0825x$, and having all the Dimensions given in the Terms of x, we have (by *Ward's* Theorem 445, Rule II.) this Equat. $\frac{25,6406x^3}{882,36} = 126$, whence $x = 16,30678 =$ the Head Diameter, $27,17797 =$ the Bung Diameter, and the Length $= 65,55571$ Inches.

Mr *Wm Bevil's* Solution is as follows:

Put $x =$ the Bung Diameter, then will $0,6x =$ that at the Head, and let $y =$ the Length of the Cask, then will $0,8y$ equal the Diagonal, and (by a Theorem in *Ward*) $\frac{2x^3 + 36x^2 - 064x^2 \times y}{882,35} = 126$, and $\frac{0,8x}{\sqrt{11}} = y$, which being put for y, in the Equation x will be equal to $27,17789 =$ the Bung Diameter, $16,306734 =$ that at the Head, and the Length $= 65,55553$ Inches.

Mr *Paul Sharp's* Solution to the same.

Put $5x = BH =$ the Bung Diameter, then that at the Head will be $= 3x = AF$; also put $5y =$ the Length of the Cask $=$ AC, and the Diagonal BF will (*per* Quest.) be $= 3y$; but it is evident (*per* Figure) that DB or GH is equal x, for $DG =$ AF is equal $3x$ by the Prob. $\therefore BG = 4x$; and (*per* 47 *E.* 1.) $64x^2 = 11y^2 \therefore y = \frac{8x}{\sqrt{11}} = nx$ (putting $\frac{8}{\sqrt{11}} = n$) hence (*per Ward*, p. 445) we have this Equation $287nx^3 = 126 \times 88,35 \therefore x = \sqrt[3]{\frac{C}{287n}} = 5,4356$ Inches; Consequently $5x = 27,178$, $3x = 16,3068$ equal the Bung and Head Diameters respectively, and $5y = 65,5533$ Inches $=$ the Length of the Cask.

The

The same answered by Mr *John Todd*.

Put $c = 126$, $5x =$ the Bung-Diameter, and $10y =$ the Cask's Length; Then $3x =$ the Head Diameter, and $6y =$ the Diagonal; also $\frac{57,4x^3 \times 10y}{882,354} = c$, and (per 47 E. 1.) $16x^4 + 25x^2 \times 36y^2 \therefore x^2 = \frac{11,7}{16}$, which substituted in the other Equation we have $\frac{3^1 57^1}{7058,83^2} = z$, $\therefore y = \sqrt[3]{\frac{7058,83^2 c}{3^1 57^1}} = 6,556$; hence the Length $= 65,56$, Bung Diameter $= 27,18$, and the Head Diameter $= 16,31$.

Question 75 answered by Mr *Rob. Robinson*.

Who, after observing that it admits of three Cases, proceeds thus:

Case I. $x^{x^x} = x^{x^2} = 27,22 + 2x$. Let $a = 1,8$, and $a - e = x$; then will $a - e^{a-e} \times \text{Log.} a - e = \text{Log.} 27,22 + 2a - 2e = \text{Log.} 30,82 - 2e = \text{Log.} 2m - 2e = \text{Log.} 2 + \text{Log.} m - e$ (where $m = 15,41$) hence $a - e^{a-e} \times \text{Hyp. Log.} a - \frac{e}{a} - \frac{e^2}{2a^2} - \frac{e^3}{3a^3}$ &c. $= \text{Hyp. Log.} 2 + \text{Hyp. Log.} m - \frac{e}{m} - \frac{e^2}{2m^2}$ &c. which Series in Numbers and reverted gives $e = 0,0023$ hence $x = 1,79.77$.

But the easiest Method of Solution is by a Table of Logarithms; thus $x^x \times \text{Log.} x$ min. $\text{Log.} 27,22 + 2x = 0$. Assume $x = 1.8$ and the above Equation gives $+,026037$ $-,050092$ $x = 1,78$

Hence $\frac{1,8 \times ,050092 + 1,78 \times ,026037}{,050092 + ,026037} = 1,793 = x$

Again, $x = 1,793$, which gives $+,026943$;

Then $\frac{1,793 \times ,026037 + 1,8 \times ,026043}{,026037 + ,026943} = 1,7965$,

this gives $,013555$;

And $\frac{1,7965 \times ,026037 + 1,8 \times ,013555}{,026037 + ,013555} = 1,7977 = x$;

and in this manner we may proceed to any Degree of Exactness.

Case II. $x^{x^x} = x^{27,22+2x}$ in Logarithms Log. Log. $x + x$ Log. x min. Log. Log. $27,22+2x$ = 0;
Assume $x = 1,78$, and the Equat. gives $+,01942$
$-,001735$;
hence $\frac{1,78 \times ,001735 + 1,77 \times ,01942}{,001735 + ,01942} = 1.7708 = x$.

Case III. $x^{x^{x+1}} = x^{27,22+2x}$ in Logarithms
Log. Log. $x + x + 1 \times$ Log. x min. Log. Log. $27,22+2x$:
Assume $x = 1,85$ and the Equation gives $-,011319$
$+,001866$;
then $\frac{1.84 \times .011319 + 1.83 \times .001816}{.011319 + .001816} = ,8385 = x$.

The same answered by Mr *Thomas Moss*.

Since x^{x^x} Log. x = Log. $27\frac{1}{3} + 2x$; therefore x^x Log. x + Log. Log. x = Log. Log. $27\frac{1}{3} + 2x$, and x Log. x = Log. Log. $27\frac{1}{3} + 2x$ − Log. Log. x; consequently x Log. x = Log. Log. x = Log. x × Log. Log. $27\frac{1}{3} + 2x$ − Log. Log. x; from which Equation x is found = 1,8005.

Mr *William Kingdon* solves it thus;

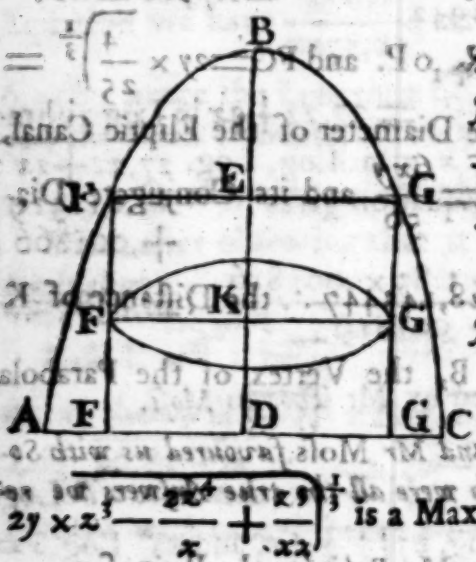
First by Logarithms we have ax Log. x + Log. x = L. Log. $27\frac{1}{3} + 2x$. Let n be assum'd nearly equal to x, and z = their Difference, $p = 27\frac{1}{3} + 2n$, b = Log. p, q = Log. b, m = Log. n, d = Log. m, and $r = 0.434294$. Then if $z+n$ be substituted for x, and put into a Series, and omitting all the Terms affected with z^2, z^3 &c. it will become $mn^2 + d + 2rm + rn + \ldots \times z = r + \frac{2r^2 z}{bp}$; but as $\frac{2r^2 z}{bp}$ is very small, it may be omitted; Then by Transposition and Division we have $z = \frac{\ldots}{\ldots} = ,00063$, whence $n+z$ (n being taken = 1,77) = 1,77063.

Mr *Bevis*, the Propoſer's, Solution to the ſame.

Let $1+v=w$, then $\overline{L.\,1+v} \times \overline{1+v^3} = \overline{L.\,27\frac{11}{20}+z+zv}$.

Put $a=27\frac{11}{20}$, then $\overline{L.\,1+v} \times \overline{1+v^3} = \overline{L.\,a+v}$, or $\frac{v}{1+v} \times \overline{1+v^3} = \frac{a+zv}{a}$, finding the Fluent and reverting the Series $v=0{,}8005$, then $x=1{,}8005$.

Queſtion 76 ſolv'd by Mr. *Tho. Perryam*.



Put $x=200=BD$, $y=AD=DC$, and (*per* Queſt.) $388-y=$ the Length of the Curve $AFB=BGC$; *per* Fluxions $\frac{3}{2}x^{\frac{1}{2}}+\frac{4y^2}{9x^{\frac{4}{3}}}\Big|^{\frac{1}{2}} \times \frac{8y^3}{27x^2} = 388-y$. Reduc'd and ſolv'd $y=139{,}72047$.

Put $z=ED$, then by the Property of the Curve, and Nature of the Queſt. $2y \times z^3 - \frac{2x^4}{x} + \frac{x^5}{xz}\Big|^{\frac{1}{3}}$ is a Maximum, which put into Fluxions and reduc'd, gives $z=\frac{3x}{5}=120$, and $FG=2y \times \frac{4}{25}\Big|^{\frac{1}{3}} = 151{,}70641\frac{1}{2}$, whence the Area of the greateſt Oblong is $=3$ A. 3 R. 0 P. But by the Queſt. FG is equal the tranſverſe Diam. and $78{,}54 \times \frac{6x}{\frac{4}{25}}\Big|^{\frac{1}{3}}$ = its Conjugate $=128.143447$; Conſequently the Diſtance of K, the Fountain's Centre from the Vertex B is equal 140 Yards.

The ſame anſwered by *William Kingſton*.

Put $x=200=BD$, $AD=DC=y$; then by the Problem $\frac{776-2y}{2}=388-y$ is equal the Length of the Curve $AFB=BGC$ (*per Fluxions*) $=x^{\frac{2}{3}}+\frac{4y^2}{9x^{\frac{4}{3}}}\Big|^{\frac{1}{2}} \times \frac{8y^3}{27x^2}$ or $x^{\frac{2}{3}}+\frac{4y^2}{9x^{\frac{4}{3}}}\Big|^{\frac{1}{2}}$

$= 388 - z + \frac{8y^3}{27x^2}$, which solv'd gives $z = 139,12047$:
$DE = \frac{1}{3}$. Then by the Property of the Curve and Nature of the Problem $zy \times z^3 - \frac{2z^4}{x} + \frac{z^5}{x^2}$ is a Maximum; which put into Fluxions and reduced gives $x = \frac{6x}{5} = 120$; whence the Area of the greateſt Oblong is $= \frac{6xy}{5} \times \frac{4}{25}$ $= 18294,76920 = 3$ A. 3 R. 0 P. and $FG = zy \times \frac{4}{25}$ $= 151,70641$ = the Tranſverſe Diameter of the Eliptic Canal, whoſe Area (by the Prob.) is $= \frac{6xy}{50}$ and its Conjugate Diameter is $= \frac{6x}{78,54 \times \frac{4}{25}} = 28,143447$ ∴ the Diſtance of K the Fountain's Centre from B, the Vertex of the Parabola $= 140$.

Mr Bamfield, *the Propoſer, and Mr* Moſs *favoured us with Solutions to this Queſtion, which were all the true Anſwers we received.*

Queſt. 77. anſwer'd by Mr. *Robinſon* the Propoſer.

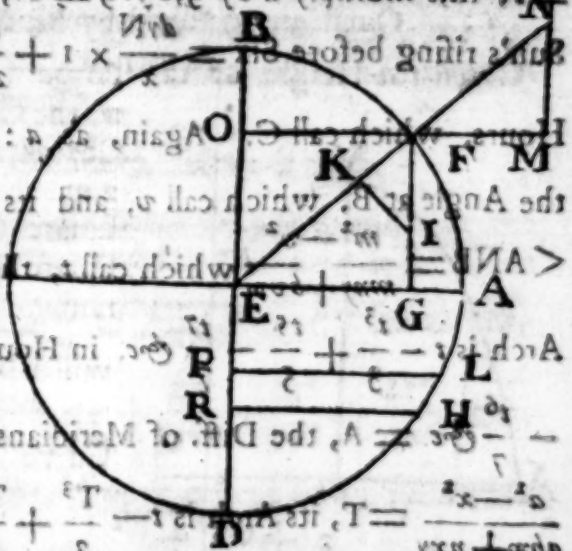
Suppoſe he departs from A, and travels along the great Circle AC to B, here is known NB = 39° 37'. Sine $= a$, Coſine $= b$, the Angle BAN = 135°, Sine $= m$, Coſine $= n$, Sun's Decl. = 23° 29' N. Tang $= d$; Let $x =$ Sine and $y =$ Coſine of AN; Then *per* Sphericks as $1 : d :: \frac{y}{x} : \frac{dy}{x} =$ the Sine of the Aſc. Difference in the Lat. departed from; The Length of its Arch is $\frac{dy}{x} + \frac{d^3y^3}{2.3x^3} + \frac{3d^5y^5}{2.4.5x^5} + \frac{3.5d^7y^7}{2.4.6.7x^7}$ &c. Rad. $= 1$,

$= 1$, this muitiply'd by $3,8319 = N$, gives the Time of the Sun's rising before Six $= \frac{dyN}{x} \times 1 + \frac{d^2y^2}{2.3x^3} + \frac{3d^3y^3}{2.4.5x^4}$ &c. Hours, which call C. Again, as $a : m :: x : \frac{mx}{a} = \text{Sine of}$ the Angle at B. which call v, and its Cosine w, then Tang. $\angle ANB = \frac{m^2 - v^2}{mw + bvm}$ which call t, then the Length of its Arch is $t - \frac{t^3}{3} + \frac{t^5}{5} - \frac{t^7}{7}$ &c. in Hours is $Nt \times 1 - \frac{t^2}{3} + \frac{t^4}{5} - \frac{t^6}{7}$ &c. $= A$, the Diff. of Meridians. Lastly, Tang. $AB = \frac{a^2 - x^2}{abw + nxy} = T$, its Arch is $t - \frac{T^3}{3} + \frac{T^5}{5}$ &c. this muitiply'd by $3443,7516 = R$ gives its Length in Sexagenary Miles $= RT + 1 - \frac{T^2}{3} + \frac{T^4}{5} - \frac{T^6}{7}$ &c. $= B$. Then the whole Time of the Journey is $4 + C - 5$ Hours, which at 10 Miles an Hour is $40 + 10C - 10A$ Miles $= B$, in which Equation substitute the Values of A, B, C, &c. instead of x^2 write its Value $1 - y^2$, and reducing the Equation y is found $= ,77878$ the Sine of $51^m\ 09'$ N. $=$ the Lat. departed from; hence AB $= 1^o\ 04'\ 32'' = 64,53$ Sexagenary Miles, the Dist. requir'd.

This Question was (by the Proposer) dated June 10th; and consequently the Sun's Declination given; but thro' the Inadvertency of the Compiler was omitted in the last Diary, and therefore could have no true Solution, but by the Proposer himself.

Question 78 answer'd by Mr *Tho. Mott.*

Let ABCD represent the Earth; BD the Equator; FO the Cosine of Latitude to the Radius BE, then the Centrifugal Force in B, according to the Direction BE or FE is to the Centrifugal Force in F, in the Direction EF, in the Duplicate Proportion of the Radius BE, to the Ordinate FO, that is $BE^2 : FO^2$. For let BO express the Centrifugal Force in B, according to the Direction BE or FI; the Centrifugal Force AF, according to the Direction EF; and IK being drawn perpendicular to FE; FK represents the Centrifugal Force



Force in E, according to the Direction FK; But BO : FI :: BE : EG (by Cor. 3. Prop. 4. Book 1. of Sir *Isaac Newton's Principia*) and because of the Rectangular similar Triangles FIK, and GFE, there is FI : FK :: EF or BE : EG; wherefore by Composition BO × FI : FK × FI :: $\overline{BE}^2$: $\overline{EG}^2$ :: BO : FK; hence it appears that the Centrifugal Force of Bodies in the Equator is to the centrifugal Force with which Bodies endeavour to recede perpendicularly from the Earth (in any Latitude) in the duplicate Proportion of Radius to the Co-sine of the Latitude.

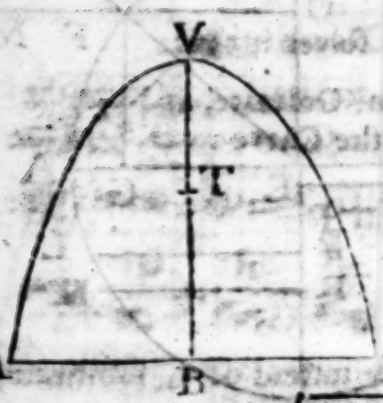
The Proposer, *Gamston Retford*, solves it thus:

In the Fig. above let BD = the Earth's Axis, EA the Radius of the Equator, PL, and RH the Radii of Parallels of Latitude; now the centrifugal Forces in the Points A, L, H are as those Radii, so that the centrifugal Force is the greatest in the Point A, and less at H than at L, and so to the Poles, where there is no Rotation; at the Point A, the Force of Gravity acteth directly from A to E, whilst the centrifugal Force acts in direct Opposition from E to A; but at E Gravity pulleth (if I may use that Expression) from F to E, whilst the Direction of the centrifugal Force is from O to F. Let the centrifugal Force in the Point F be expres'd by the Line FM, and EF being continued to N, let fall the Perpendicular NM; the Force FM, according to the Method of resolving Forces may be resolv'd into two Forces, viz. MN and FN, the latter whereof acts only in Opposition to Gravity, the other no ways affecting it; and since the Triangles EMN and OEF are similar, the centrifugal Force at the Point A is to the centrifugal Force at F as EA is to OE, that is, as the Square of the Radius is to the Square of the Sine Complement of the Latitude. Q. E. D.

Question

Question 79 solv'd by Mr *Rob. Robinson*.

Given the Height of the Tower in T = 120,125 Feet = w, the Curve AVA = 39.24716 Chains = 2590.31256 Feet = $2m$, the Area AVA = 2304 square Chains = 1003622.4 square Feet = $2n$; Let the Parameter = a, and BA = y, then will VB be = $\frac{y^2}{a}$, and the Curve VA = $\frac{y}{2a}\sqrt{a^2+4y^2}+$



$a \times$ Hyp. Log. $\frac{2y+\sqrt{a^2+4y^2}}{a} = m$, but $\frac{2y^3}{a} = n$ $\therefore a = \frac{2y^3}{3n}$ and then the Equation is $\frac{\sqrt{y^4+9n^2}}{2y} + \frac{3837643y^3}{n} \times$ Log. $\frac{3n+\sqrt{y^4+9n^2}}{y^2} = m$, solv'd $y = 792$, hence $a = 660$, and the Tang. of the Sun's Declination is $\frac{2w}{a} = .382197 =$ 20° 55′ = Co Latitude; hence the Latitude is 62° 05′ N. and the Day of Observation is *May* the 14th, or *July* the 8th.

The same answered by M. *Tho Moss*.

Put the Area = a, the Length of the Curve = b, the Semi-Ordinate = y, and the Parameter = v; then by the Property of the Curve the Abscissa is = $\frac{y^2}{v}$ and the Area = $\frac{4y^3}{3v} = a$; but $y\frac{\sqrt{4y^2+v^2}}{2v} + \frac{v}{4}$ into Log. $\frac{2y+\sqrt{v^2+y^2}}{v} = b$, from these two Equations, the Ordinate, Parameter, and Abscissa may be determined, and are 1584, 660 and 950.4 Yards, respectively; Now put the Height of the Tower = h, the Parameter (as found above) = p, and the Sine of the Sun's Declination = x, then the Sine of the Latitude of the Place will be $\sqrt{1-x^2}$; therefore, by p. 184. of *Simpson's* Fluxions $\frac{2hx}{\sqrt{1-x^2}} = p$, and $x = \frac{p}{\sqrt{4h^2+p^2}}$ = the Sine of the Sun's Decli-

declination, answering to 20° 55′ = Co. Lat. hence the Latitude of the Place is 69° 05′ N. and the Day of Observation *May* the 14th, or *July* the 8th.

The Proposer, Mr *Sharp*, solves it thus:

Put x = the Abscissa, y = the Semi-Ordinate, and v = the Parameter: Then by the Nature of the Curve $vx = y^2 \therefore x^2 = \frac{y^4}{v^2}$; whence $\sqrt{x^2+y^2} = \frac{y}{v}\sqrt{v^2+4y^2}$ = the xn of the Curve; the Fluent of which is $y + \frac{2y^3}{3v^2} - \frac{2y^5}{5v^4} + \frac{4y^7}{7v^6}$ &c. $= \frac{39,24716}{2} = m$ (*per Quest*) now instead of v, substitute $\frac{2x^2}{y}$, and we shall have $y + \frac{2x^3}{3y} - \frac{2x^4}{5y^3} + \frac{4x^6}{7y^5} = m$; But by the Nature of the Parabola $\frac{4xy}{3} = a = 230,4$ squ. Chains $x = \frac{3a}{4y}$, Put $\frac{3a}{4} = n$, then will $x = \frac{n}{y}$, which substituted in the above Series for x, gives $y + \frac{2n^2}{3y^3} - \frac{2n^4}{5y^7} + \frac{4n^6}{7y^{11}}$ &c. $= m$; which reverted gives $y = 12 \therefore x = 14,4$, and $v = 10$ Chains $= 660$ Feet $= c$; Now put $126,12 = S$, the Sine and Co-sine of the Latitude of the Place $= x$ and y respectively, and Rad $= 1$; Then by the Elements of Trigonometry we have $\frac{2Sx}{y} = c$ (see *Simpson's* Dissert. p. 156.) $\therefore \frac{x}{y} = \frac{c}{2S} = 2,61645 = 69° 5′ =$ the Latitude of the Place; whence the Sun's Declination is $= 20° 55′$ N. answering to *May* the 14th.

Quest. 80 answered.

This Question was propos'd to be solv'd by a simple Equation, *but the Proposer's own Solution was not true, as we found by examining it; which we suspect was owing to his not throughly considering the Nature and Properties of the Triangles necessary to the Solution; he taking them to be* Plain, *when they are really* Spherical: *Therefore we think it convenient to omit his, and insert the following Solution:*

Let a = Nat. Sine of the Sun's Declination for the Time propos'd (which will be found = 208 1711 = Tang^t of the same; p and q the Sine and Cos. of half the Sum of the Amplitude and Azimuth at 6 = 23° 37′; x and y the Sine and Cos. of half their Difference; then will $py+qx$ = Sine Amp. $py-qx$ = Sine Az. $px+qy$ = Cos. and $\frac{py-qx}{px+qy}$ = Tangent.

Then (*per* common Properties) as $py+qx : a :: 1 (= \text{Rad.}) : \frac{a}{py+qx}$ = Cos. Lat. And $t : 1 :: \frac{py-qx}{px+qy} : \frac{py-qx}{t \times px+qy}$ = Co. Lat. also $\therefore \frac{a}{py+qx} = \frac{py-qx}{t \times px+qy}$; which Equation reduc'd and solv'd, will give x = 1885 answering in the Tables to 10° 52′; consequently the Amplitude = 34° 29′; the Azimuth at 6 = 12° 45′; and the Latitude of the Place 52° 15′ North.

We once more return Thanks to our Contributors, and hope they will be pleas'd to continue their Favours as usual: But must once more desire they'll send them within the Time limited in the Advertisement. Some valuable Letters came in too late to be inserted this Year, which cannot be published the next with any Convenience to the Contributors, nor even consistent with the Work.

I. PARADOX answer'd by *Philo Musæus*.

Old *Thomas* he does take a Wife,
And has a Son call'd *Sam*,
Which Son, to make an End of Strife,
Espouses honest *Nan*,
Who by a former Husband had
(If I the Truth must tell)
A Lass, which made old *Nanny* glad,
And she was called *Nell*.
At length poor *Thomas*, woe's his Heart,
His Wife she dies and leaves him,
Next marries *Nell* to shorten Smart;
Such Losses not long grieve him:

By her he has two pretty Boys
Call'd *Anthony* and *David*,
Who are the Crown of all his Joys,
And just as he would have it:
Sam dies the next; his Wife he leaves,
Who with her Daughter tarries,
Not for her Husband long she grieves,
None knows how soon she marries.

H. PARADOX answer'd by *Philo Musæus*.

From *Hammond's* Bed, whereon he lay at rest,
At Three Miles Distance let a Clock be plac'd;
Suppose each Stroke One Second be of Time,
When Twelve o' Clock most sweetly it does chime:
And grant the Yards Sound in One Second moves,
Three hundred Sixty nine, as *Halley* proves;
Hence by these Maxims it is plainly clear'd,
Twelve Strokes were struck before the first was heard.

The REBUS answer'd in an Acrostic, by *Philo Musæus*.

*N*ear *Trent's* clear Stream a wealthy Town there stands,
*O*f old renown'd, and known to distant Lands:
*T*o this fair Place young *Colin* took his way,
*T*o meet his *Phœbe* on a sporting Day;
*I*n vain he sought, in vain thro' Crouds he went,
*N*or *Phœbe* found, nor could he have Content;
*G*reat were his Pains to find this lovely Maid,
*H*e ne'er suspecting that he was betray'd:
*A*t length quite tir'd, he musing thus sat down,
*M*ore Nymphs there are in NOTTINGHAM fair Town.

Both the PARADOXES *and* REBUS, *were answered in nearly the same manner by several of our ingenious Contributors, which, for want of Room, we are oblig'd to omit, and refer to the Catalogue at the End of the Book.*

ANSWERS to the ÆNIGMAS in the last Year's DIARY.

I. LIGHT.
II. GAPING, or YAWNING.
III. NONSENSE.
IV. GENTLEMAN'S DIARY.
V. NOTHING.
VI. POVERTY.
VII. GUNPOWDER.

All the Ænigmas answer'd in the following Lines to to Mr *Bamfield* of *Honiton*, by Mr *Samuel Hammond*.

Prophetic Bard! tho' some think Prophecies
Are only Nonsense which from Vapours rise,
Thou darkly didst presage the evil Plight
Of thy * *sweet Town* when thou didst sing of Light;
Which is from Fire an Emanation bright
And, by the Bason in thy Garden planted,
Didst intimate that Water would be Wanted.

But some will say, If *Bamfield* did foresee
The Conflagration, pray why did not he
Inform his Neighbours, that they might prevent
The shocking Change their Houses underwent:
Whose Gaping Chasms, Beams to Powder turn'd,
Declare he knew not that they would be burn'd:
Besides, his *Riddle* and his *Question* too
None did, till after, in the Diary view;
Which proves that he before-hand Nothing knew.

To which I thus in Order Answer make:
As *Virgil* sung of Christ by a Mistake,
Not knowing such a Man would ever be;
So *Bamfield*, *Honiton*, mysteriously
Did sing o' th' Element that ruin'd thee.
And tho' his Lays did not in Print appear
Till *Honiton* was burnt near Half a Year,
Yet the orig'nal Manuscript, I'm sure,
Was seen at *N—tt—ngh—m* some Months before.

* Alluding to its being compounded of *Honey* and *Town*.

All the Ænigmas answer'd by Mr *James Hall* of *Tenterden* in *Kent*.

One *Saturday* Night, in Poetical Plight,
To Your Diary I sat myself down, Sir;
If my Muse I could wheedle to answer each Riddle,
And send you up one of my own, Sir.
So I got me some Paper, and a Poor Farthing Taper,
Some Pens too, and Ink for that End, Sir;
But could make Nothing out, for my Muse in a Pout
Bid me leave, for she'd not stand my Friend, Sir.

" What

"What NONSENSE this Letter, shall I never write better?" 3
So in Passion I snatch'd up my Feather;
But my LIGHT began setting, and I fell a fretting, 1
So I GAP'D — and to Sleep both together. 2

All the ÆNIGMAS answer'd by *Sam. Squib*, in *Strephon's* Complaint of *Delia's* Coldness.

The Silver Moon serenely shone on high,
And glimm'ring Stars gave LIGHT to all the Sky: 1
When YAWNING *Strephon* rising from his Bed, 2
With anxious Grief express'd his Mind, and said:
Is this, my fairest *Delia*, my Reward?
And must I die unpity'd and unheard?
Wilt thou still scorn my Vows, and ne'er be kind?
O! Thought afflicting to a Lover's Mind!
NOTHING but she delights my Mind, nor can 3
The *Riddles* in the DI'RY ease my Pain. 4
How much more easy would it be by far
The pinching Wants of POVERTY to bear; 6
Or face the fiercest BATTERY in War, 7
'Tis NONSENSE thus to argue with the Fair; 5
Fashion, alas! is her peculiar Care;
Then, *Strephon*, quench thy long unanswer'd Fire,
Mind what the common Wants of Life require:
No longer trust to her enchanting Face;
Beauty's a Charm, but soon the Charm will pass.

They were answer'd in like manner by Mr William Dickes, *Mr* William Mobbs, *Mr* Rob. Hall, *Mr* James Collingridge, *Mr* Nich. Styles, *Mr* Wm Bevil, *Mr* Wm Aldridge, *Mr* F. Mingle, *Mrs* Martha Brown, *Mr* Ralph Hulse, Pretty Molly Abecedrian, *Mr* J. Hollingworth, *Mr* Lashmar, *Miss* Polly Bright, *Mr* Anth. Moore, *and several others, whose Names are inserted in the Catalogue at the End.*

PARADOX I. by Mr *Samuel Hammond.*

Ye Gamesters, who study the Cards and the Dice,
And often at both practise ev'ry Device,
Say, how I at PUT Three such Hands may compose,
That when my Opponent hath One of them chose,

Whiche'er of us leadeth, with One of the Two
Remaining, I may my Opponent subdue;
Then resuming my *Cards*, with the Last of the Three
Forementioned Hands he may after beat me;
And (which is most strange) with the First beaten Hand
I may foil that which did its Conq'ter command.

PARADOX II. by Mr *James Hall*.

There is (as *Butler* says) a Town.
To those that dwell therein well known;
Sum of whose Length, if rightly done,
Is just One thousand Fifty one,
I don't say Miles; and yet they tell
'Tis at first Entrance but an Ell.
Nor think this Story I invent;
Believe me, Sirs, it is in *Kent*.

New MATHEMATICAL QUESTIONS *to be answer'd in the next* Year's Diary.

(1) Question 81. by Mr *Thp. Moss*.

The Base, the greater Angle at the Base, and the Ratio of the Sides of a plain Triangle being given, 'tis requir'd from thence to construct and determine each Side of the said Triangle, without drawing a Line parallel to any Side thereof?

(2) Question 82. by Mr *John Todd*.

There are Two certain Ports in North Latitude, from the Southermost of which a Ship sets sail to go the nearest Way she possibly can to the other Port, and finds the Distance run equal 1574 Miles, and her Departure from the Meridian 636 Miles; but returning the same Way back, her Departure was found equal 938 Miles. *Quære* the Latitudes, and Difference of Longitude, of these Two Ports?

(3) Question 83. by Mr *Thomas Perryam*.

A Captain of a Privateer seeing a Merchant Ship at S. S. E. sailing due West, continually bears directly upon her in a right Line, and coming up with her, it appear'd that the Merchant's Ship had sail'd 30 Miles during the Chace, and

that

hat the ſaid Privateer was 21 Miles diſtant from her when he Chace firſt began. Now ſuppoſing each Ship's Motion o be uniform during the whole Chace, To find from thence he Diſtance ſail'd by the ſaid Privateer, its Eaſt and Weſt Departure, and alſo their Difference of Latitude when they were North and South of each other.

(4) Queſtion 84. by Mr *William Sutton*.

Sometime in the Summer Quarter 1748, at a certain Place n North Latitude, the Altitude of the Sun at Four o' Clock n the Afternoon was found to be 26° 43′ 39″, and his ſetting Amplitude the ſame Afternoon 18° 12′ 36″ from the Weſt; From whence 'tis requir'd to give the Latitude of the Place, and Day of Obſervation?

(5) Queſtion 85. by Mr *Charles Dyer*.

There is a certain Fruſtum of a Cone
Whoſe true Solidity * in th' Margin's ſhewn, [* 2 Feet ſolid]
It's greateſt inſcrib'd Sphere likewiſe will be
Juſt half the Fruſtum's true Solidity.
Now from theſe Data, pleaſe to make appear
The Fruſtum's true Dimenſions the next Year.

(6) Queſtion 86. by Mr *William Kingſton*.

Given the Length of the Curve of a Parabola = 39,24716 Chains, and its Area = 230,4; Thence to determine the Abſciſſa and Semiordinate thereof?

(7) Queſtion 87. by Mr *Paul Sharp*.

There are two Ports, A and B, in North Latitude, whoſe Difference of Longitude is 60 Degrees, and Diſtance from each other (on the Arch of a great Circle) = 42° 48′ 38″; now exactly in the Midway between A and B ſtands a third Port D, whoſe Latitude is known to be 52° 17′. *Quære* the Latitude of the other two Ports (B the Eaſtermoſt being the leaſt) and alſo the Bearing of each from the middle Port D?

(8) Queſtion 88. by Mr *Anth. Baker*.

What is the Northern Latitude, Day of the Month, and Time of the Day, in the Year 1749, when the Sun's Alti-

tude, his Azimuth from the East, the Arcs to Noon, and Co-Latitude of the Place are equal to each other.

(9) Question 89. by Mr *The. Mast.*

The Area, Perimeter, and the Sum of the Base and Difference of the Sides of a Plain Triangle being given; It is required to determine each Side thereof separately.

(10) Question 90. by Mr *James Collingridge.*

Suppose a Stick perfect cylindrical 50 Inches long, and Length of the Arm 20 Inches: *Quære* the Centre of Percussion, supposing a 2 Pound Weight fasten'd 4 Inches from the Hand, and 5 Pounds quite at the other End.

New ÆNIGMAS to be answer'd in the next Year's *Diary.*

(1) ÆNIGMA 52. by Mr *Samuel Hammond*, wherein all the last Year's Ænigmas are answer'd.

Ye Wits, who imitate th' Almighty Pow'r
In bringing hidden Things to LIGHT, explore
My Name; that once adorn'd your DIARY before.
I once did reign in Heav'n 'bout Half an Hour,
As Holy Writ reveals, but ne'er had Pow'r
To reassume my Throne, nor shall for evermore;
Yet am coeval with Eternity,
And was e're Nature first began to be;
'Twas one vast NOTHING all, and all slept fast in me.
With me in private modest Dulness lies,
And in my Bosom lurks in Thought's Disguise;
I varnish GAPING Fools, and often cheat the Wise;
Yet my Indulgence is by both confess'd:
NONSENSE by me lies sleeping in the Breast;
And 'tis in me at last that Wisdom seeks for Rest.
I am the Knave's Repute, the Whore's good Name,
The only Honour of the wishing Dame;
My very WANT of Tongue makes me a kind of Fame.

I some-

Sometimes at the Conventicles am
Of those who most gainst POWDER'D Beaus declaim,
And in Judicial Courts oft called for by Name,
Where I determine ev'ry Argument.
Tho' seemingly to ev'ry thing consent,
And often Truth conceal, yet Falshood never vent.

(2) ÆNIGMA 53. by Mr *Samuel Bamfield*, wherein the last Year's Ænigmas are all answer'd.

Exploring Authors of this DIARY, I
Will ope my Curtains wide, you may descry
The nicest Composition ever made,
The most mysterious Object e'er display'd.
NOTHING will here conceal that I shou'd say,
But speak as clear as th' LIGHT of YAWNing Day.
At a small Distance, Artists, you may see
My beauteous Sister, which does well agree
In Shape, Construction, and in Size with me;
And many Philosophic Sons of Art
Have learnedly anatomiz'd each Part.
I'm of magnetic Pow'r —— for thus I act ——
Sometimes attracted, and sometimes attract,
Like the nice Stone which teaches Men to guide
The WARlike Ship thro' Waves and furious Tide.
To each Possessor I am always found,
A welcome Friend, throughout this earthly Round.
When I near beauteous *Chloe's* Brains appear,
The longing Lovers Hearts are fill'd with Care,
For sure I am, no NONSENSE harbours there:
Whether or no they're wealthy *Monarchs* brave,
Or *Slaves* to POVERTY that little have.
I many Hours sometimes must lie conceal'd,
And then with fringed Vallens closely veil'd;
The better to resume my wonted Pow'r,
To find the Sea, the Town, the Hill, the Bower:
Creatures on Earth I can with Ease discover,
But their all-wise *Creator* did I never.

(3) ÆNIGMA 54. by Mr *James Hall*.

I shall not undertake to tell ye,
A long Detail of Back and Belly;

Or

Or be so curious as to ape,
Th' exact Idea of my Shape:
But know in short, I live and reign,
The Scourge and Terror of the Plain.
Philosopher like I am rever'd,
For Churlishness, and Length of Beard:
Ev'n Kings (no Stain to Honour's Call)
Yield me contentedly the Wall.
Let *Pope* be censur'd for Ill-Nature,
To me compar'd he's mere dull Satyr;
Poets may write, present their Quill,
But where were Feathers known to kill?
'Tis mine to act the nobler Part,
'Tis mine to make the Senses smart;
And, spite of all that *Zeno* spoke,
Convince 'em — Pain's beyond a Joke.
Sometimes from Hedging took and Ditching,
I've been prefer'd into a Kitchen;
There I, who Doctors Arts defy'd,
And their *Cantharides* bely'd,
Myself am maim'd, disarm'd, and foil'd;
And thus my boasted Glory spoil'd;
By my own Laws try'd like a Traytor,
They put a Bite upon the Biter.

(4) ÆNIGMA 55. by Mr *William Chapple*.

A num'rous Race now overspread the Earth,
Who from their Parents Head derive their Birth,
Begot so like *Minerva*, some infer,
'Tis fit they shou'd be patroniz'd by her.
Various their Titles, Parties, and Professions,
Their Stature, Age, Alliance, and Successions;
Some live till aged, others quickly die,
And few are blest with Immortality.
They're for the most part learned and polite,
And in a kind of Commonwealth unite;
Have their Divines, their Lawyers, and Physicians,
Poets, Philosophers, and Politicians.

Of

Of these an ancient noble Family,
rom whom I'm proud to draw my Pedigree
roduc'd some one in *ev'ry* Science skill'd,
nd Tribute from the rest their Treas'ry fill'd;
f which (as one of the Fraternity)
proper Portion is assign'd to me.
hus qualify'd to lead the Way to Truth,
y chief Employment is instructing Youth.
Not but that sometimes ev'n the Sage and Wise
n Difficulties do with me advise;
heir Doubts to my Decision they refer,
nd I in common *Queries* seldom err.
ut tho' I am esteem'd an Oracle,
ome of my Brethren are more fallible,
Who solving Questions more abstruse than I,
Answer the Quærist with less Certainty.
At length consulted thus on all Occasions,
y those of different Languages and Nations,
o Bus'ness I'm become a perfect Slave,
ll us'd by those whom I Assistance gave,
Till quite worn out I in Oblivion make my Grave.

(5) ÆNIGMA 56 by Mr *William Dyke*.

Kind Sirs, a Name to me perhaps you'll give,
Since greatest Pleasures you from me derive;
I cannot say unmix'd, for some Alloy
Proceeds from me to interrupt your Joy;
For such my Nature is, 'tis plain, from me
Flow either Happiness or Misery;
And sometimes both, my Consequence is such,
That I to either can assign too much;
No more wou'd *Celia* be with Beauty clad,
Shou'd I forbear Ten thousand Charms to add:
Nor longer wou'd fond *Damon's* am'rous Breast
Be rack'd with Cares, his Soul with Grief oppress,
Shou'd I be unassisting, for 'tis I
Give Love the Wings on which it soars so high.
Crown'd with great Sweetness is my pleasing Birth,
The which is shewn in various Kinds of Mirth:

And yet, alas! so short's my longest stay,
I just appear, and vanish quite away.
Yet of so much commanding Pow'r, that I
In heavy Chains the stoutest Hearts can tie.
Nay *Kings* for me wou'd gladly bow, ev'n kneel,
And *martial Heroes* fall on angry Steel.
I Rich, and Poor, and Great, and Wise, engage,
And yet am styl'd the Impudence of th' Age:
And not quite undeserving, for I am
Th' Original of cursed Vice and Shame:
My dearest Friends like *Judas* I ensnare,
Who've prais'd me much, and nourish'd me with Care,
But I regard not either Good or Ill,
For to a Fool I turn a Man of Skill:
Tho' I a vile Protector seem to be
Of Discord, Malice, and of Calumny:
Know by an Hint, which you'll no doubt take right,
Tho' I divide, I always must unite;
For chiefest Friends without me cannot part,
'Cause I engage the Wishes of their Heart;
I firmest Oaths and Protestations seal,
Am call'd a Witness Falshood to reveal.

(6) ÆNIGMA 57. by Mr *Thomas Hayward*.

In chiefest Truth it may be said,
That I at first by *God* was made.
But clear the Myst'ry if you can,
What I am now was made by *Man*;
By mystic Words it is my Fate
To change my Name, and eke my State.
But this alone explains the Riddle,
When you I tell — my *End* is my *Middle*.

(7) ÆNIGMA 58. by Mr *Samuel Hammond*.

I travel much by Night as well as Day,
Yet ne'er, but when o'ercharg'd with Liquor, stray,
For then the common Road's too narrow, and
I from it deviate on either Hand.
My Body long, in Form is *Serpentine*,
Which (like that Reptile) sever'd will conjoin;

nvenous (like Fish and Men of Pow'r)
daily ſmaller of my Kind devour.
e while I ſwiftly run, another crawl,
nd ſometimes ſcarcely ſeem to move at all;
hus var'ing Pace, increaſe in Size and Fame,
ntil I loſe in Marri'ge Bed my Name,
s does my Spouſe; which Loſes to ſupply
nother Name is found to call us by;
ot each another Name, for One will do,
s being join'd in One, who elſe were Two.
y native Country is fair *Staffordſhire*,
hich leaving in my Infancy, I ſteer
y oblique Courſe towards the riſing Sun,
ore whom I was, ſhall be till Time is done.
lho' I dodge, in winding Turns you'll find me,
or (like the Snail) I leave a Track behind me;
et, left to you, Sirs, I ſhou'd be unknown ſtill,
m Nameſake to a famous gen'ral Council.

(8) ÆNIGMA 59. by Mr *William Jepſon*.

claim not my Birth from the Womb of the Earth,
But the Fleſh and the Blood of the Living;
Am an Implement common, us'd by Man and Woman
As I'll ſhew, without any Deceiving.
'm near a Foot long, and tolerably ſtrong,
So doubt not of giving Content;
And tho' *Circumciſion* hath chang'd my Condition,
You know for my good it was meant.
Young *Bards* for their Pleaſure, jade me beyond meaſure,
Nay ev'n to the Stump they will ply me;
Sometimes the *Muſicians*, and *Mathematicians*,
(As well as the Bards) will employ me.
The *Prieſts* now and then, to get One in Ten,
With a fair *Mare* will ply me in private;
Tho' the Charms of her Face, all over I trace,
'Tis nothing but Profit they drive at.
The *Barriſter* he, and *Phyſician* for Fee,
Both frequently uſe we at Will;
With the *Proctor* 'tis a Maxim to keep me in Action,
For then I bring Griſt to his Mill.

Not

Not a *Lady* i'th' Land, but will give me her Hand,
(The *Princeſs* herſelf won't refuſe me)
Tho' their Beauty ſhine bright, yet they're ne'er thou
polite,
Unleſs they at Pleaſure can uſe me.
I've a Dribbling at th' *Noſe*, at my Patron's Diſpoſe,
By which my Perfections appear;
It behind leaves a Stain, which for Time will remain,
Tho' perhaps mayn't continue a Year.
But obſerve by the bye, when moſt vigorous I,
A few Minutes Labour will drain me;
Henceforward diſcarded, and no more regarded;
Then why ſhou'd I longer detain ye?
All ye bright Sons of Merit will freely declare it,
You'll my faithful Services own;
And now I'm exhauſted of all that I boaſted,
My *Name* and Character make known.

(9) ÆNIGMA 60. by *Trebor Arabrab.*

Let Artiſts, who from Age to Age ſurvive,
Boaſt of their preſent Glories whilſt alive;
I challenge *Nature's* Wiſdom to produce,
The like for public Service, or for Uſe.
I'm an Invention of an ancient Race,
Soon after *Adam*, brought to Birth a Place;
I like a Boat am made, tho' not ſo long,
And have two *Noſes* clad in Armour ſtrong,
One *Eye* like *Harpies*, ſhort of Sight am I,
Tho' on my Side it ſerves me when I fly;
It guides my Body at each cheerful Lay,
Chirping like the ſweet joyous Lark in *May*.
Ten thouſand Tranſports of *Britannia's* Train,
Rev'rence my near approaching, and my Name;
For at my Coming Rank and File they ſtand;
Me in the midſt, they trembling on each hand.
And I ſuch Pity on their Meekneſs take,
Each Moment ſpend my Bowels for their Sake;
Yet tho' my Entrails have ſo uſeful been,
On me they always want to wreak their Spleen;

So all my Goodneſs amongſt them is loſt,
For by Degrees I out of Doors am toſt,
But mark the wondrous Annals I record,
And view the ſpacious Temple of the Lord;
My Handy Works you may for ever view,
With *King*, and *Beggar*, and I think with you.

(16) ÆNIGMA 61. by *Alexander Buttonhole* Eſq.

I to no Place, or Country am confin'd,
But live in all, and dance with ev'ry Wind;
Yet ſometimes firm to all their bluſt'ring Noiſe,
I brave, unmov'd, the Furies of the Skies.
Where plodding Fools their empty Skulls employ
In building Manſions of chimereal Joy,
I fix my Theatre by myſterious Rules
And am myſelf both *Workman*, *Stuff*, and *Tools*:
The ample Walls that deck the beauteous Pile,
Might make Sir *Kit* and hoary Sages ſmile!
Sometimes of *Portland* hue; ſometimes they glow
With all the various Colours of the Bow;
Sometimes impearl'd, they gliſter thro' the Fields,
And yield a Glaze, the brillant Di'mond yields;
Sometimes diſtorted from their nat'ral Uſe,
They palliating, gild the thin Excuſe,
Which broken Vows, and new *Amours* produce.
Here ſhrin'd in *State*, I lead a ſingle *Life*,
Without a *Servant*, *Children*, or a *Wife*.
The ſole Companions that I care to know,
Are, or the Dead, or ſuch as muſt be ſo!
My Colours various, but my Labours more,
Sometimes I furniſh Med'cine for the Poor,
And ſometimes ev'n the Rich themſelves have deign'd
To try my Virtue, and their Health regain'd:
But to confeſs — (what Quacks can ne'er endure)
Like all the reſt, I oftner kill than cure.

An

An *Alphabetical Catalogue* of CONTRIBUTORS to this Diary, ſhewing by the Numerical Letters i, ii, iii, &c. which Queſt. and by 1, 2, 3, 4, &c. what Enigmas each anſwered.

Mr. Sam. Atkin iii, iv. 1, 2, 4, 6, and Reb. Mr. Wm. Aldridge all Æ. in Verſe, and Reb. Abecedrian Dº. Mr. Tho. Allen 1, 2, 4, 6, 7, 2ᵈ Par. Reb. in Verſe, and all Ecl. Mr John Brown all Æ. but 2. both Par. Reb. and cal. Ecl. Mr Wm Bevil i, ii, iv, v, all Æ. but 3 in Ver. Reb. and both Par. Mr Geo. Brown iv. 1, 4, 5, 6, 7. two Ecl. and Moon's Tran. Mr Sam. Bamfield all Æ. in Ver. and Errata. Mr Joh. Barbitt 1, 4, 7. both Par. and Reb. in Verſe. Mrs Martha Brown, 1, 3, 4, 6, 7. in Ver. 2ᵈ Par. and Reb. Mr Ant. Baker ii, iii, iv. 1, 2, 4, 6, 7. both Par. and Reb. Bobbin Joan all Æ. Mr. Tho. Cowper i, iv. all Æ. but 2, 3, 7, 3ᵈ Par. cal. 2 Ecl. Occul. Cor Scorp. and Reb. Mr Jam. Collingridge iv, v, all Æ. in Verſe and Reb. Mr. Wm Caile all Æ. but 2ᵈ, both Par. Reb. and cal. 2 Ecl. Mr John Cheſter 1, 4, 5, 6, in Ver. both Par. and Reb. Mr Abr. Clark 1, 3, 4, 6, 7, 2ᵈ Par. Reb. and Ecl. Mr Rich. Collins 1, 4, 5, 7 in Ver. 1ſt Par. and Reb. Mr Wm Dickes, all Æ. in Ver. and Reb. Mr Ben. Donn i, ii, iii, x. all Æ. but 3ᵈ, Reb. and cal. all Ecl. Mr Cha. Dyer i, iii, iv. Mr Sam. Everit 4, 6, 7 and Reb. Mr Wm Foxton all Æ. but 3ᵈ, both Par. Reb. and cal. 2 Ecl. Mr Rob. Hall 1, 2, 4, 5 in Ver. 2ᵈ Par. and Reb. Mr James 1, 4, 5, 6, 7. Mr Tho. Hare ii, iv. all Æ. and Reb. Mr Wm Hesford 1, 4, 5, 7, 3ᵈ Par. and Reb. Mr John Harvey 1, 4, 6, 7, and Sun Ecl. Mr John Hall all in Ver. and Errata. Mr Ralph Hulſe all Æ. in Ver. Reb. and all Ecl. Mr John Hollingworth Sun Ing. into the 12 Signs, Moon's Long. Lunations, and Planets Places for every 6 Day, all Ecl. all Æ. Reb. and both Par. Mr Sam. Hammond all Æ. in Ver. both Par. and Reb. Mr Wm Kingſtone all Q. but viii and x. all Æ. but 2 and 3, both Par. and Reb. Mr Ed. Laſhmar all but 3 in Verſe, and Reb. in Ver. Mr Wm Mabbe all but 3 in Ver. both Par. and 2 Ecl. Mr Tho Moſs all but vii. Mr F. Mingle all Æ. in Ver. Philo Muſeus 1, 4, 6, both Par. and Reb. in Ver. Mr Alex. Man 2 Ecl. Mr Anth. Moore all Æ. but 2 and 2 in Verſe. Philoleuthenus i, iv. 4, 6, 7, and Moon's Ecl. Mr Tho. Perryman all but viii and x. 1, 4, 5, 6, 7, both Par. and Reb. Mr Reb. Robinſon i, ii, iii, iv, v, ix. Mr Tho. Smith 4, 6, 7, 1ſt Pa. and Reb. Mr Nich. Styles all Æ. in Ver. 2ᵈ Par. and Reb. Mr Wm Sutton i, iii, iv. Mr Sam. Sutton 2 Ecl. and Moon's Tranſit. Sam Squib all in Verſe but 3ᵈ. Mr Tho. Sparrow all but 3ᵈ, and 2 Ecl. Mr Paul Sharp i, ii, iii, iv, all Æ. and Rebus. Mr John Todd i, ii, iv. J. S. Temple all Ecl. and Lunations. Mrs Suſanna Tomlinſon Reb. Mr Ja. Tory ii. Mr Tho. Wade i, iii, iv. 1, 4, 6, both Par. and Reb. Mr Joſ. Walker all but 2ᵈ, and 2 Ecl. Mr Wm Wallhead all but 3ᵈ, 2 Par. Reb. and 2 Ecl.

FINIS.

ERRATA *Diary* 1748. P. 37. *after* Serene within, *read* Go, utter this, &c. *then after* Canatemise *read* The loveliest Nymph, &c.